

THE LARYNGOSCOPE.

VOL. XXX.

ST. LOUIS, MAY, 1920.

No. 5.

ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding
that they are contributed exclusively to THE LARYNGOSCOPE.)

PRESENT STATUS OF PLASTIC SURGERY ABOUT THE EAR, FACE AND NECK.

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Division;

1. As results of war injuries.
2. In civil life.
 - a. From diseases.
 - b. Injuries.
 - c. Congenital.
 - d. Cosmetic.
 - e. Psychic or imaginary.

I. *Plastics in War Injuries:* Owing to the results from severe wounds and diseases of so many men in the World's War, there was and is a great demand for physicians and surgeons to correct and reconstruct these defects. Cases requiring plastic surgery about the head, face and neck, make up a very large portion, although comparatively a small proportion of Americans as to those of the other nations who were in the fight since 1914 and 1915.

During the years of 1915-16-17 I presented papers before the Chicago Odontographic Society, Illinois Dental, Chicago Oto-Laryngologic Society, the American Academy of Ophthalmology and Oto-Laryngology, Dominion Medical Association and Alabama State Association in which I urged oto-laryngologists, ophthalmologists and oral surgeons of America to turn their attention to the training of

plastic surgery in order that when the time came (I was certain it would come) they would be ready to do their part.

In 1917, when the United States entered the war, the Surgeon General in his organization of the Division of the Head, made provision for a department of Plastic and Oral Surgery under the command of Dr. Vilray P. Blair, of St. Louis. He very ably and rapidly developed a school and classes for the education of men who would be employed in the service along these lines. I had the great pleasure and privilege of teaching in some of these classes as to what I knew of reconstructive work from my previous experience in civil life as well as from reading, and personal communication with English, French, Italian, Austrian and German surgeons as to their experience in war plastics since 1914. In these cases I was struck by the absence of men from the oto-laryngological field, for I expected and hoped, they would be the first to enter this service. When I was asked by the department at Washington to recommend some men whom I knew and thought would like this special assignment, I received some of the most uncomplimentary replies, as well as poor excuses why they could not serve. I mention this fact advisedly at the present time, because it seems as though only that type of plastic surgery which has to do with cosmetics or beautifying as, for instance, taking off of a hump or filling up a saddle defect of the nose, and which really calls for very little surgical skill, appears to interest some oto-laryngologists.

There are two periods during which plastic work is performed, namely, immediately after injury and secondarily or later. In the immediate operations, one attempts to bring the parts together as nearly normal as possible, both from the cosmetic side as well as functionally. This is very frequently not feasible by virtue of the fact that the patient's general condition will not permit operating upon him or the tissues locally are not fit for operation, as f. i., foreign bodies, infections, lack of circulation, etc. In such cases one will frequently defer the work for a secondary operation. Secondary operations are also performed to improve previously corrected parts. This is rather the rule and it is not uncommon to have a case in which as many as fifteen operations are performed before a satisfactory physiologic and cosmetic result is obtained.

In the discussion of the various forms of war injuries about the head, face and neck requiring plastic surgery, it is not possible to classify them on account of their multiplicity of conditions, consequently no specific rules can be made as to their management; in

other words, every case is a law unto itself. The degree of the injury, the condition of the tissues, locally, and the general condition of the patient, are of importance as to the result that may be expected.

In my own service at the American Red Cross Hospital No. 113, at Cognac, France, and Czecho-Slovak Red Cross Hospital at Prague, Bohemia, where I had charge of general as well as special work, there came under my care 326 cases of plastic surgery of which 88 cases were of head, face and neck injuries. These were divided into—

1. Scalp and skull plastics, including upper part of orbit and upper eyelid.
2. External nose, including lower eyelid or upper lip.
3. Upper maxilla including external nose, upper lip or lower eyelid.
4. Inferior maxilla, including lower lip.
5. Both upper and lower maxilla including one or both lips.
6. Lower maxilla and neck wound with or without perforation of the larynx, trachea or esophagus.
7. Neck wound with or without perforation of the larynx, trachea or esophagus.
8. External ear.
9. Compound in which more than one of the above mentioned injuries were present.

These divisions could be further sub-divided as f. i. Severance of large blood vessels and nerves, etc., but for a simple classification and easy indexing the above division served me very well, and in my observation of other surgeons' services, I found that this same classification would have answered the practical purpose.

The immediate result from operations on these cases in my service, was far from satisfactory, because they were or had become infected and practically every case demanded one or more secondary operations. The same was true in my observation of other work. It is very regrettable that in my service as well as that of many other men, the results of the secondary operations could not be followed up, owing to the fact of the patients being transferred to their respective homes, for further observation or operations.

There were, however, many places where I had the pleasure of observing cases that had been operated upon all the way from one day to four and one-half years before as well as seeing different

operators and many operations, so that I have formed a fair opinion as to results and selection of operations. While there has not developed anything remarkable or particularly new in plastic surgery in this war, there can be no question that much was learned from the large amount of material which the war furnished. I shall not attempt to go into great detail in describing operations, but will illustrate some of the work I have observed and make comments thereon.

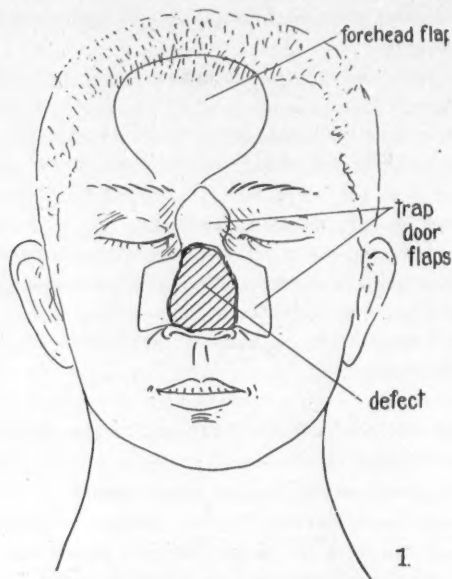


Fig. 1. Reconstruction of nose (English).

Owing to the peculiar service that I had, I was enabled to visit many military hospitals in the Allied countries, particularly in France, Italy and England and, therefore, had a great opportunity of seeing the good as well as the bad. I have selected some of the procedures and have taken the liberty of illustrating them not with any idea of publishing other men's work ahead of their original articles, nor that anyone, especially those not familiar with plastic work, shall be able to perform such operations, but merely to report some of the interesting work I have seen over there.

Fig. 1. Nasal Defects: The following four illustrations show steps of an operation that appeared to give better results than any

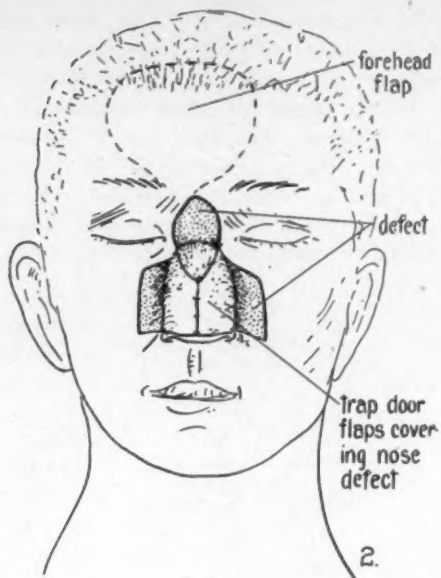


Fig. I.

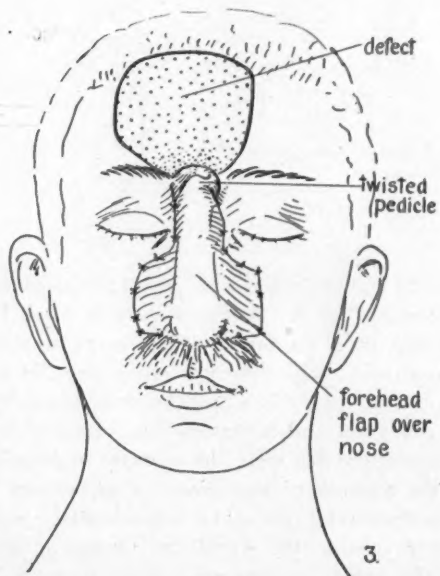


Fig. I.

other, when the defect was confined to the lower portion of the nose. I had the pleasure of seeing cases operated upon by this method as presented in London to the British Medical Association as well as at Sidcop, Queens' Hospital, Canadian Division, under the head of Dr. Waldron. The work done at that hospital under the direction of Dr. Gillis was excellent and his publication (text-book) should be seen by all who are interested in the subject.

Fig. II. Nasal Defects: The following three illustrations show particularly LaMaitre's operative procedures as carried out at the

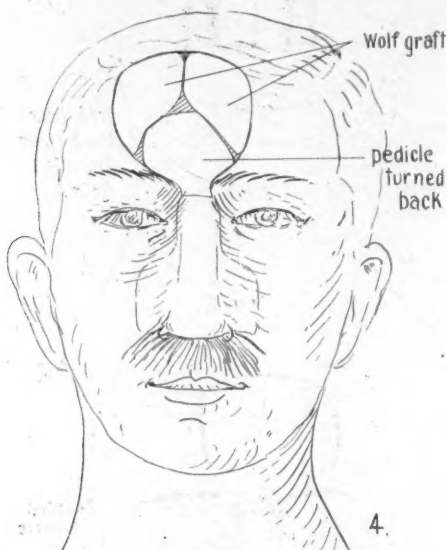


Fig. I.

hospital at Vichy and he prefers it to any other procedure in defects particularly suitable for it. At times there is planted a piece of bone or cartilage under the forehead flap several weeks before the latter is transplanted. One very interesting point in Le Maitre's operation, is the fact that it is a one-step procedure. There are so many other important and interesting facts about this and many other of his operations that would be of worth to describe here, but this is not the purpose of my paper. Consequently the writer would suggest the careful reading Le Maitre's plastic work which is to appear very soon in the Annals of Otology, Rhinology and Laryngology, St. Louis.

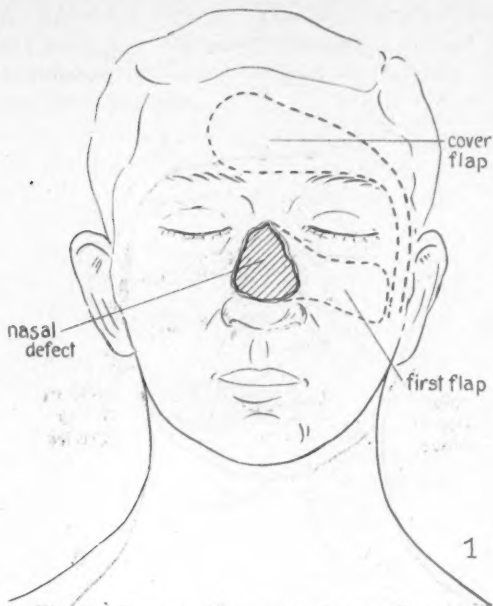


Fig. II. Reconstruction external nose (French).

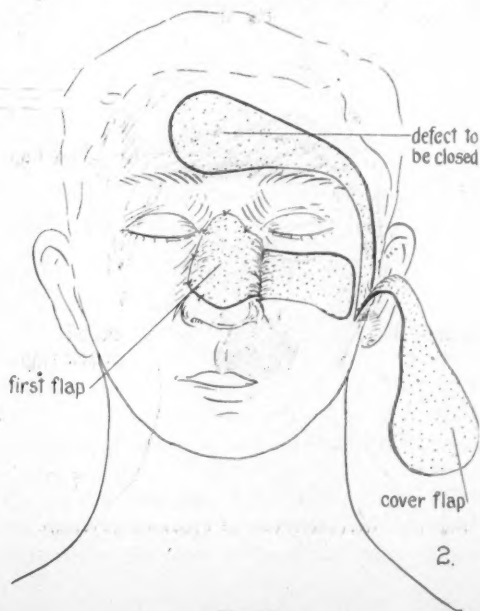


Fig. II.

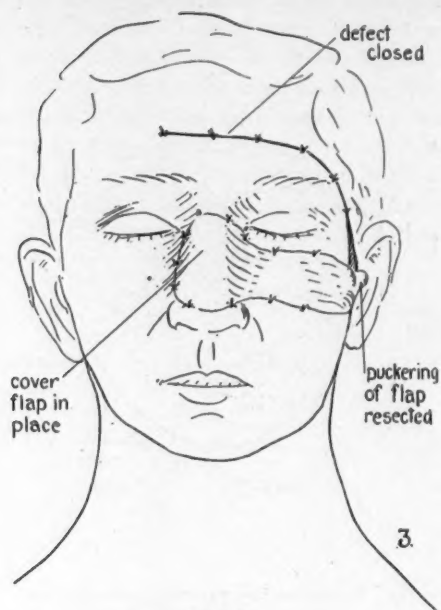


Fig. II.

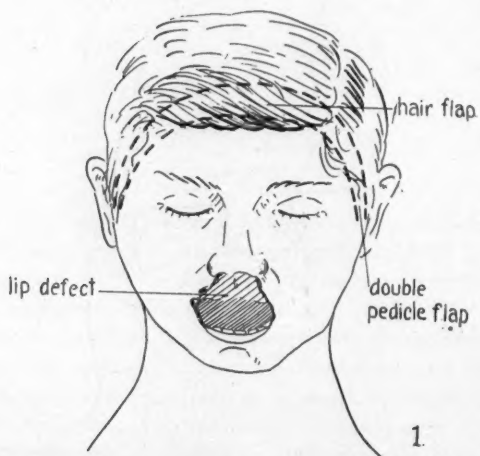


Fig. III. Reconstruction of upper lip (French).

Fig. III. Upper Lip Defects: The following three illustrations show a very novel and satisfactory procedure employed by Sibelo and his associates at the Valde Gras Hospital, in Paris. Of course, it is only applicable to males.

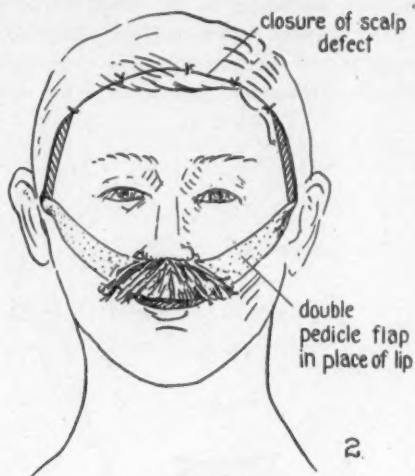


Fig. III.

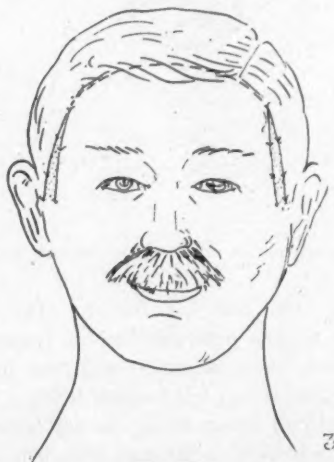


Fig. III.

Fig. IV. Lower Jaw and Lip Defect: The following three illustrations show how easily very large double pedicle skin flaps can be taken from the neck without any great amount of scar

formation resulting, not functional disturbances. It enables one to do subsequent bone implantation for lower mandible reconstruction. Both the English and the French make use of similar technic. The operations on the lower jaw as suggested by Cole are perhaps the best that were done anywhere in the world. The pedicle graft appears to be more favored than transplant. La Maitre lays much stress on regeneration of the periosteum in obtaining a solid jaw, whereas the English, Italians and Americans do not take much stock in it.



Fig. IV. Reconstruction of lower lip (French and English).

Fig. V. Lower Jaw and Lip Defect: The following three illustrations show a very novel method of reconstruction and I believe offer a much better ultimate result than just shown. The rolled-up mass of skin, etc., is left hanging by its pedicle for several weeks, being placed into defect during the day, aiding speaking and eating. It is held in place by a bandage when it is sutured in place. I have seen a number of these cases in Prague, and also in Paris.

Fig. VI and VII. Bone and Cartilage Transplants: In order to stiffen parts in reconstruction of nose, jaws, etc., the English



Fig. IV.

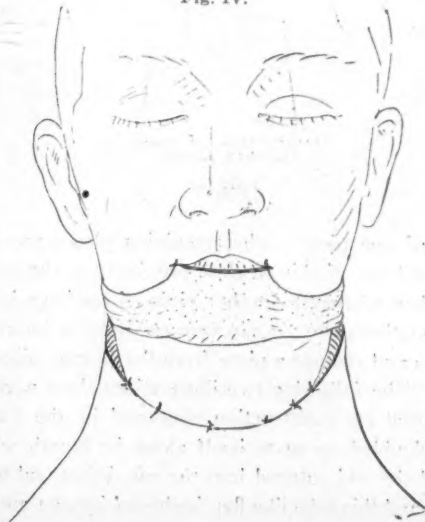


Fig. IV.

have employed the crest of the illium in preference to the anterior border of the tibia (Rysdon said that they had several cases of fractures of the tibia following removal of the parts of same). My idea is that it was probably due to a secondary rarifying osteitis, causing the fracture rather than that too much was removed. In the use of cartilage transplants a very practical and novel idea is the resection of several pieces of costal cartilage but only perhaps

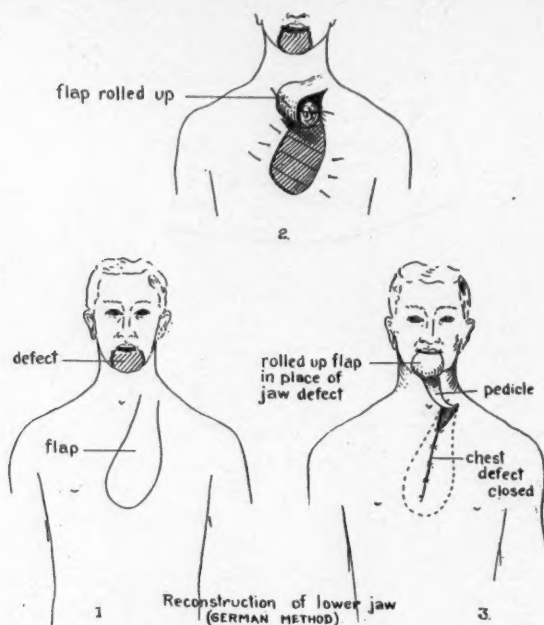


Fig. V.

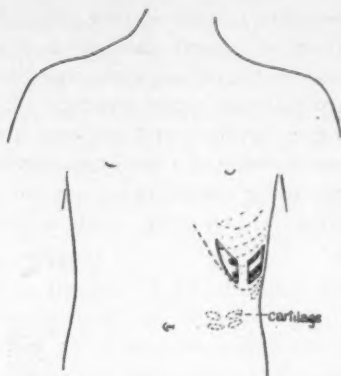
making use of one piece. The remaining pieces are placed right under the true layer of skin in close proximity to the incision which is closed. Then whenever another piece of cartilage is required in the same or another case, one can very easily open the incision under local anesthesia and remove a piece from the storage place.

Fig. VIII. The following two illustrations show a very practical flap for external ear construction employed by the English. The neck flap is doubled up upon itself along its length with the skin outwards and the end sutured into the ear defect, subsequently the pedicle is out and this tube like flap is shaped into an auricle.



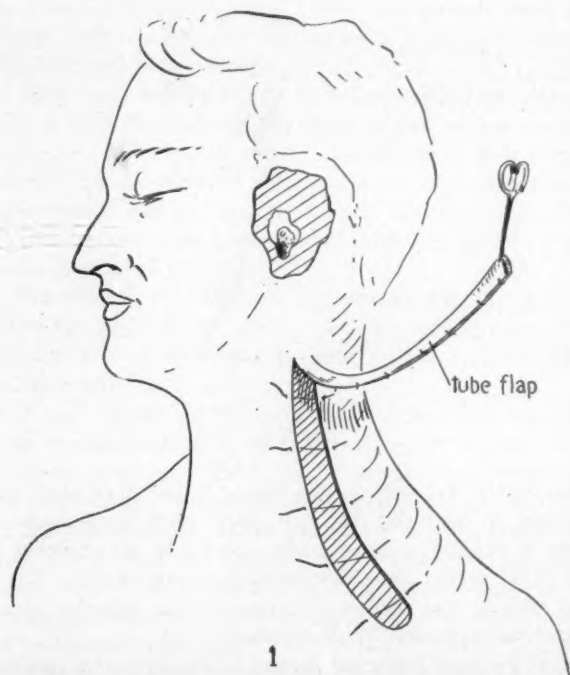
Operation for reconstruction
of the lower jaw
(English)

Fig. VI.



Cartilage Storage
(English)

Fig. VII.



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Fig. VIII. Tubular flap. External ear reconstruction (English).

There are a number of other procedures that have been developed, which are of interest especially in Maxillo-facial plastics. I have reference to the various appliances, but there too each case requires its particular constructed apparatus. In this connection, La Maitre's work shop was the best I ever saw, it demonstrated the importance of the association of a dentist, mechanician and plastic surgeon.

One striking feature to me was the rarity with which the Italian operation was performed. Only in Italy I have seen cases operated



2

Fig. VIII.

by that method and very few at that. On the other hand, considerable use of Wolf and Thiersch grafts were being made. The keeping in position of these grafts (Stent) by the modeling compound in the orbital and oral cavities give good results. The open wound dressing was another departure and less infection of milder character was noticeable in consequence.

One of the most important factors in the successful outcome of plastic operations, is not to operate too soon after the primary or

previously performed secondary operation. This fact was thoroughly exemplified over there in that the intermediary waiting period was usually from three to six months. In civil life it is most difficult to put off patients who are constantly urging to have the work finished. Operating too early after a previous operation has caused several defeats in my practice.

In regard to my observation in plastic work in American hospitals abroad I am not able to say very much, simply because there were not many cases and too early to judge.

At the American Red Cross Hospital No. 1, at Nuille, France, I saw about two hundred maxillo-facial and other head plastics in charge of Dr. Coughland making use of methods entirely individual.

Considerable stress was laid upon the use of Carrell Dakin's solution and the bacterial control before operation was undertaken.

At the Base Hospital No. 115, at Vichy, I was disappointed not to find any face, head or jaw plastics, only a few lid cases in charge of Dr. Francis. In this country I have seen recently some of the cases that were sent back for further work at Jefferson Barracks, Ft. McHenry and Walter Reed.

Dr. Blair, who was in charge at Jefferson Barracks, was kind enough to show me some of his cases as well as operate a most difficult case. His development of the technic in that particular case the day before operation, exemplified one of the characteristics of a good plastic surgeon, namely patience. Casts, photographs and artistic illustrations were shown in abundance and should be of considerable value when published.

Dr. Schaeffer at Ft. McHenry was equally desirous of showing me all he had and I should say his operating technic, cases, demonstrations, as well as their records, casts, models, photographs, etc., would stand criticism as good work.

Dr. Ivy, in charge at Walter Reed, had the advantage of the previous two gentlemen, in that the equipment, artists, etc., appeared to be of a higher standard and therefore could demonstrate to better advantage. Some of the most interesting cases were shown to me and an operation on the lower jaw was performed in the classical Cole method of a pedicle graft. Particularly valuable was my observation in the Dental Mechanics laboratory, where the various appliances were made by what appeared experts and reminded me of La Maitre's work shop.

The results from the surgical standpoint, I believe, cannot be improved upon, but cosmetically and functionally there is much to

be wished for. This I say from my observations on cases which I have observed that have come under my care at the Marine and Public Health Hospital in Chicago for further operations. Most of these cases have never seen the three hospitals nor surgeons just mentioned but were cases that were taken care of at regular base hospitals over there and sent back much earlier than these mentioned at Jefferson Barracks, McHenry and Walter Reed.

Finally there has developed this fact, that practically in no instance was a soldier willing to accept an artificial ear, nose, jaw or part of face instead of a reconstructed one by operation though the prothesis was much better looking.

2. *Plastics in Civil Life.* A. "*Following Disease*": Following diseases such as syphilis and tuberculosis are responsible for the largest number, but with the present mode of treatment by salvarsan in lues and radiotherapy in tuberculosis there will be a marked decrease in their production. The treatment scar formation as an end result of a healed out luetic nose gives the greatest difficulty in the healing of the parts after operation. It is therefore best to remove as much as possible of this scar tissue even the defect made greater by so doing. Although one considers the case cured of syphilis with a negative Wasserman for some time. I have found the giving of salvarsan at the time or just before the operation, to be of value in the healing of the parts.

There is one operation following the disease of atrophic rhinitis that I wish to describe very briefly which is a plastic for therapeutic of physiologic purposes. I have already reported on the use of fascia lata implantation for this purpose, but now I employ only septum, both cartilage and bone, obtained from a freshly submucous resected septum, just preceding the operation.

The technic is very simple. One performs a thorough dissection of muco-peristium and perichondrium as in an extensive submucous resection, then break through the cartilage and bone at several places. This is done for the purpose of permitting circulation between the two layers of perichondrium and peristium, thus improving the nourishment of the implants. The just previously resected septum (having tested the blood for proper grouping of donor and recipient) is now cut into small pieces and put between the muco-periosteal and perichondrium flaps, taking great care not to allow contact with the distention, at the inferior meatus. The incision is closed by a stitch and sealed with collodion.

Lupus or tuberculosis, which are much more rare, will cause deformities of the tip of the nose or the lae. Since the use of x-ray and radium treatment has substituted the surgical attacks, the subsequent plastic results are far more satisfactory, owing to less frequent recurrences of the disease.

Malignant growth particularly epithelium both of ears, external nasal, eye lids and lips make up quite a number of cases that require plastic operations subsequent to x-ray, radium or surgical intervention.

(b) *Traumatic.* These have increased very much in the past few years due to automobile accidents, but on the other hand have decreased considerably from occupational causes. The latter is due to the fact that manufacturing plants are more careful in the fitting out of shops with safety devices and there are special Insurance Boards who look after these matters, in order to safeguard both employer, employee and insurance company. There is no possibility of classifying cases of injury which are the same as those occurring in war times and every case is a law unto itself. One type of traumatic deformity has interested me particularly, namely facial paralysis, and I shall describe same more in detail with report of some cases.

c. *Congenital Defects.* Three types of deformities have presented themselves to me more frequently than any other, and these are:

1. Total or partial loss of external ears.
2. Marked shortening or absence of calomella with absence of septal cartilage.
3. Cleft palate and harelip.

1. In the correction of the "*external ear*" I have now four cases under treatment of reconstruction and will very briefly describe them, because, thus far, the subject has not received the attention that it should. The first illustration, Fig. IX, shows the cases before anything had been done. They are from $2\frac{1}{2}$ years to 6 years of age. One is a bilateral case. X-ray of mastoid shows in each case the evidence of a middle ear and outline of the internal ear. Rotation test shows functioning vestibular apparatus in three, however, duration of nystagmus much reduced in deficient ear. Attempts made in the younger children as to the ability to hear by the aid of the noise apparatus was not successful because all these children refused to permit the buzzer in their ear. The oldest (girl 6 years)



Fig. IX.



Fig. IX.



Fig. IX.



Fig. IX.

did permit it, and I found that she did not hear on the defective side, although there was a nystagmus on rotation present.

The second illustration, Fig X, shows the children after one or more operation, of adding tissue by pedicle flaps from the mastoid and neck regions. Cartilage transplants will be employed when the soft parts of this ear is finished, rather than immediately, because from my previous experiences with the shrinking began it crumbled the cartilage out of shape. I shall make use of costal cartilage from mother or father (depending upon the result of the tritating test of blood of donor as well as recipient of the tissue). In the past year I have made use of resected septum cartilage and bone of other



Fig. X.

patients proving up this above mentioned grouping by the blood test.

2. Congenital absence of part or all of the septal cartilage, causing the squashed tip of the nose with a very short collomella. This in turn causes the greatest diameter of the nostrils to be in the horizontal rather than the vertical meridian. The correction of this condition is very easy by taking a section of the rib which contains both bone and cartilage. The bony portion comes in contact with the floor of the nose at the rostrum, thus getting bony union.

3. *Cleft-Palate and Harelip Operation.* This is such a very large subject that a paper taking full time limit would not be too much. I shall, however, confine my remarks to conclusion that I have arrived in the ultimate results of the cases that I have had.

1. The earlier that I had the infant to operate the better the results.

2. Always do both lip, hard and soft palate the same time, even though the hard palate may require another and another operation.

3. In bringing the premaxillae in apposition it is of great importance not to penetrate with all kinds of awls, needles and wires, this destroying the follicles, arresting the development of the jaw and loss of permanent incisor teeth.

4. Great effort is to be made to make both nostrils similar as well as avoiding dimpling or puckering of the lip at the mucocutaneous junction.

5. Most of my failures of nonunion of soft and hard palate I believe were due to lack of freshening of margins of the cleft as well as not sufficient laxity of the dissected mucous membrane. In small perforations of the hard palate which have had several operations, having as a result considerable scarring I have succeeded in bringing down the inferior turbinated body and closing it.

d. *Cosmetics*: There are type of deformities or malformations about the head that are borderline cases, and should receive our most careful and expert attention. I have reference to congenital malformations as a large hump nose, saddle nose, extreme bulbous tip, extreme small or large nostrils, short upper lip, massive hanging lower lip, deformed ears, etc. Many of these patients have talents and opportunities in public or social life, but keep out of it on account of being sensitive or so handicapped as not to obtain positions which they otherwise would.

e. *Psychic or Imaginary*. This form of deformity or malformation is probably more frequently met with than medical men have any idea, simply because most of these unfortunate mental cases fall into or are forced upon the "quack" beauty specialist. I mean they are forced upon them by the regular physician and surgeon who recognizes the patient to be a neurotic or mental case, refuses to operate upon them. These patients are the most difficult to handle, no matter from what standpoint considered. It is the duty of every physician and surgeon to try and argue with them, to convince them that correction is unnecessary. Only in a small minority will one succeed. It may be well for him to show the patient some of the bad results that have been obtained at the hands of the quack, such as parafinomas, etc. In this connection I wish to call attention to a horrible case of parafinoma recently coming under my

care and in which I believe I made a valuable discovery as to the treatment of this terrible condition.

Miss N. Apparently had nothing the matter with her nose; Fig. XI, went to some doctors in Minneapolis requesting to have her nose operated for some imaginary deformity. He refused, so she followed the alluring advertisements of a Chicago Charlatan, beauty doctor, who injected her with paraffin. There resulted a typical parafinoma, causing the girl mental and physical pain. Fig. XII shows how she looked. In order to study the histologic and chem-



Fig. XI.

ical change of the tissue, I excised a piece from the center where there is seen a scar, Fig XII. Leaving the cut surface covered only with a thin layer of gauze, I noticed that from the margins there was an outpouring of a thick whitish substance which proved to be paraffin, relieving the pain and making the tissues much softer. Whether the skin will recover so as to be able to do a minor operation or whether the entire nasal form work will have to be decorated as in rhinophema I am not able to say at this time.

While the open treatment to the parafinoma was beneficial in that considerable amount of the paraffine escaped, it was such a slow process that I decided to operate upon her. Under general



Fig. XII.



Fig. XIII.



Fig. XIV. Paraffinoma.

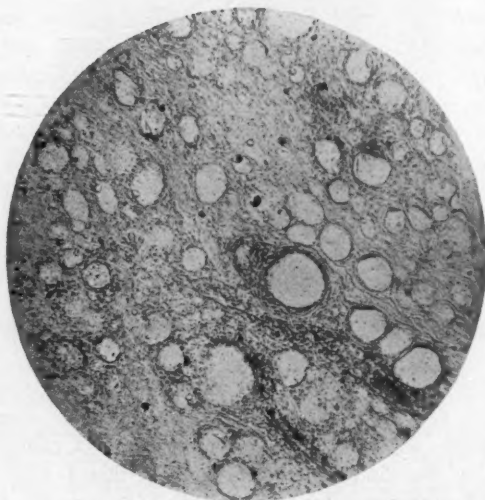


Fig. XV. (High Power) Paraffinoma.

anesthesia (local being impossible, owing to the great pain in even inserting the hypodermic needle) the skin about the nose not involved in the parafinoma was dissected and the masses of the tumor resected, Fig. XIV, and subjected to microscopic examination, Fig. XV. The tip of the nose which contained very little parafin was, however, much changed by a rhinophemic appearance. The venules were much dilated and increased in number. To destroy them, I applied 25 mm. of radium by means of needles, which were left in for eight hours at two different periods. Fig. XVI shows the case as it appears now. Some time later I intend to do a



Fig. XVI.

rhinoplastic operation to cover the defect at the dorsum of the nose.

As to being satisfied with the cosmetic result it is practically unheard of, the patient asks for further correction even if it is ever so little. Recently there had come to me a case that is so important in the discussion of my subject that I will ask your indulgence to listen to what may be called idle gossip. Important because work done by two of our prominent oto-laryngologists and one general surgeon prominent in this line of work have

allowed themselves to be coaxed into operating one of these poor rich creatures, to their detriment, the patient and science. Mrs. X, about 35 years of age, having one child, all the comforts of a home, decided that now the time has arrived when she must have something done to her nose, particularly the point must be more prominent. She actually shuns the society of her friends, being so conscious of her deformity. A photograph shown to me of her appearance at that time shows a well proportioned nose and face. Traveling very far she reaches the doctor with the reputation (for she will never consult a charlatan or advertising quack) who tells her that she does not need the operation and she leaves him satisfied and contented to leave well enough alone. The same day, however, the specialist has her notified that all is prepared for her operation for the next morning. Greatly surprised she declares that she will now abide by the doctor's advice not to be operated upon, whereupon the doctor telephones himself stating that she had better have it done for she will never rest until it is done. Going to the doctor's office she was operated under local anesthesia in a sitting posture. The doctor took something out of the inside of her nose and put it over the bridge, right under the skin. This caused a bad hump and she was much displeased as well as enraged at the enormous fee demanded. Returning back to her home she was much distracted over her appearance, consulted an oto-laryngologist who also did some work in this line. This gentleman resected a piece of rib which fractured into three parts causing an empyema for which she was twice operated. The transplant into the side of her nose (alae) made things much worse and she was now in a horrible condition (all these are exact expressions of patient as taken down by stenographer). In due time she had heard of another great man, this time general surgeon, who, according to medical publications, could help her, so she again travels far to have the real work done. She had also received information that in the vicinity of this general surgeon there were two other oto-laryngologists that had reputations as plastic surgeons, so she consulted them also; however, neither one of these would give her any satisfaction. Consequently she was operated upon by this general surgeon (specialist in plastics) who resected a piece of rib on the opposite side of chest and planted a strip over the bridge of the nose, through an external incision at the root of the nose. He really made a prominent tip and she thought now that she would be satisfied. Alas, not so, the sides of the nose were now

very unsightly and caused her whole facial expression to change to an abnormal one. Besides, this strip that the last doctor put in was so close under the skin at the tip as to make it red and painful, also fearing it might push through.

This threatening ulceration of the transplant, caused her family physician to write to me about the case in detail and asked me to take charge. Knowing the type of these patients, I discouraged him to send her on such a great distance, but she appeared nevertheless. I found a highly cultured lady, absolutely normal in every way, mentally and physically, now very sorry as to what she had done and made the request that she wished she could have her nose as it was before anything had been done.

Examination showed the transplant protruding at the tip of the nose, being covered by a thin layer of epithelium and surrounded by a red and painful area. I condescended to remove the transplant and at the same time implant some fat in the tip of the nose, to prevent subsequent shrinkage. This was accomplished without any difficulty by making a small incision in the columella, that left no visible scar. The patient left very much happier than she came, the operation having prevented an ulceration with possible secondary infection and a disastrous result. That the patient will not be satisfied with the cosmetic result, there is not much doubt in my mind, but the lesson she has learned should be a warning to others wanting such work done, or to the surgeon condescending to perform such operation. As stated before there is a very sharp line of differentiation between real cosmetic cases and such as these last two illustrated.

2551 N. Clark St.

ETHMOIDAL OPERATIONS FOR PAN SINUSITIS, OPENING THE ACCESSORY SINUSES—OPERATIVE DANGER ALMOST NIL, WITH GOOD RESULTS.*

DR. W. PERRY REAVES, Greensboro, N. C.

The object of this paper is not to describe a new operation, but to discuss conditions that I believe essential to both operator and patient, that both may feel sure of the safety of the operation and a good result.

In mastoid surgery two operations have become standardized—the simple and radical. The operator may modify the technique and operation, but still he does the simple or radical. Many of you who have chairs in universities or on hospital staffs know well how much better the new specialist is equipped for mastoid surgery than sinus work, when he has received his certificate or diploma for a few weeks, months or years as the standard may be of each institution. I believe if the consensus of opinions of rhinologists were taken that the operation and the end results of sinus surgery would be about on a par with tonsil surgery some ten years ago, when clipping the tonsil, using punches to remove part of the tonsil and the finger dissection were in practice. These unsurgical, incomplete and traumatic operations, their poor results or deformities of the fauces have led to the development of the snare, knives, Sluder and other operations to enucleate the tonsil, until now the mother will tell you that she wants the tonsils removed with its capsule and soon she may add capsule only and not the muscle fascia. Is it not possible to standardize ethmoid and sinus work? Something concrete and safe so that the specialist will develop in sinus surgery as he has developed in mastoid and tonsil surgery?

A forward step in this direction can be taken by protecting the patient from fear, pain and shock, and the operator from fear of accident that may happen when his technique is trusted to position and sensation of touch in an anatomical field that has its many variations and may be further distorted by the pathological condition. Is it any wonder that the weak point in our specialty is sinus surgery? Is this the result of the tendency in teaching to sacrifice thoroughness and safety for speed? If seeing is essential to safety for the average operator, then he must have his patient

*Presented to the Twenty-fourth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, Cleveland, October 17, 1919.

in a position that permits of seeing without giving both the patient and the operator the neck ache, so often the result of the sitting posture. This is easily done in the reclining or semi-reclining position, any operating table will do. The Holmes chair is well adapted for this work, as you can get any position with it. The bleeding that goes into the nasopharynx is cleared from the throat and expectorated into a towel or basin. The blood in the field of operation is cleared by any of the operators' pet method of sponging. In those cases of too free bleeding, for sponging he will find the blood suction apparatus a great aid. The preparation of the patient and the field of operation is another important link in the operation. A grain of codine by mouth or one-sixth grain of morphia by hypo will do much to allay the fear of the patient and helps to control the pain. One should use the least amount of cocain possible to get anesthesia. This is done by applying it about the exit of the nasal nerve, roof of the nose and sphenoid opening and under the middle turbinate. The amount of cocain can be reduced to a negligible quantity by following it with 3 cc. of .1% novocain and 2 mm. of adrenalin injected under the periosteum of the middle turbinate about the area of meckles ganglion and the septum just opposite the sphenoid opening. The point of injection is not so important, as the infiltration from the middle turbinate will practically anesthetize the ethmoid region. We have now met our first obligation to our patient, boosted him up with an opiate, put him in reclining position, which practically eliminate fainting, substituting non-toxic novocain for toxic cocaine. Under these conditions the operator is not rushed for time from the patient's standpoint. The operator can now do a thorough, clean, ethmoidectomy and open the sinuses with little trauma to surrounding tissues, which lessens the post operative pain and saves the operator's time in after treatment. In short, 30 minutes spent on the operation really becomes the operator's speed in the total amount of time given each case.

Those who have passed the experimental stage of operative danger in the rapid exenteration of the ethmoid cells with the curette or with forceps which remove the cells *en masse*, may find it hard to slow up to teach safety first to the beginner. My experience has been in these rapid operations, even one can do them without danger to the patient. The muco-periosteum is curretted or pulled from the roof of the ethmoid and orbital walls which is to become part of the roof of the nose and part of its external wall.

The periosteum of this muco-periosteum as it passes through the apertures, especially as it passes through the ethmoidal foramen, may be stripped with its blood-vessels, giving the patient a black eye from orbital hemorrhage. This muco-periosteum will not be reformed but instead the operative field of the ethmoid will be covered by granulating tissue, which will become scar tissue or a boggy mass to harbor infection. On the other hand, if we leave the muco-periosteum covering the field of operation, which becomes part of the nasal wall—we have a membrane that performs the function

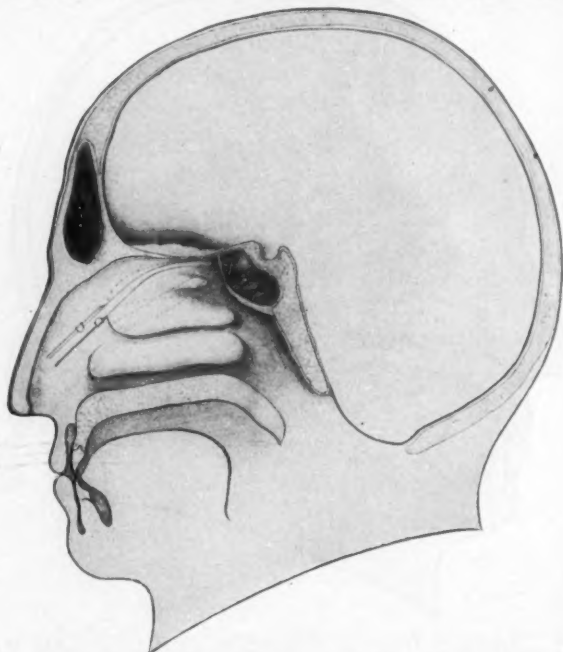


Fig. 1. Ethmoid knife in position, knife just in front of sphenoid, third hook engaging anterior end of middle turbinate ready to make cut forward as indicated by dotted line above instrument. Dotted line below instrument shows direction of cuts that would be made by straight knife and knife cutting downward.

in the nose almost as well as the mucous membrane that has been removed.

The desire to leave the operative field covered with the muco-periosteum has robbed me of my speed in ethmoidectomies. The operative technique that is necessary to do this is also the technique for safety, which is the ethmoid cells must be removed from the

ethmoidal roof and orbital wall with instruments that are sharp enough to cut cleanly, remove only that in the grasp of the instrument to eliminate any stripping or torsion beyond the instrument. The same principles apply to the sinuses, especially the sphenoid.

In deviated septum, preliminary sub-mucous resection of the septum is necessary in some cases to have space to work and especially to see the field of operation.

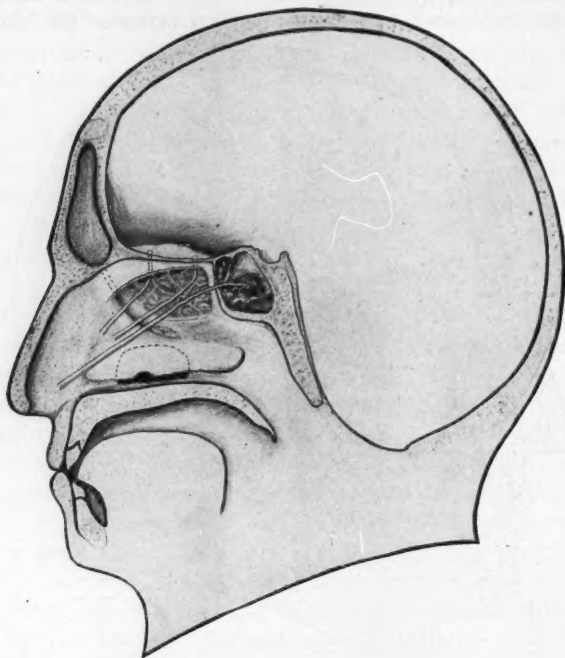


Fig. 2. This shows first step of ethmoidectomy completed and antrum opened under inferior turbinate with punch without sacrificing middle turbinate.

One of our best teachers is by comparison—mastoid work has been standardized. If we can apply these principles and the technique to sinus surgery we have gone forward another step. Have you ever thought of the similarity in the mastoid operation and an ethmoidectomy? The first step in the mastoid operation is cutting through the soft parts and removing the external plate of the mastoid antrum with chisels, forceps, curetts or burrs. Would one dare from an anatomical knowledge, position and

sense of touch, complete the operation with the curette, endangering the sinus, dura and facial? Such is not my observation—speed becomes caution at this point. The antrum is cleared of its contents. The operator hunts for the safety landmarks, the inner plate which covers the dura and sinus and the aditus ad antrum. From these points the adjacent mastoid cells can be removed, avoiding danger to dura, sinus and facial.

How like is the ethmoidectomy when divided into two steps. The first step is the removing the middle turbinate, the vertical

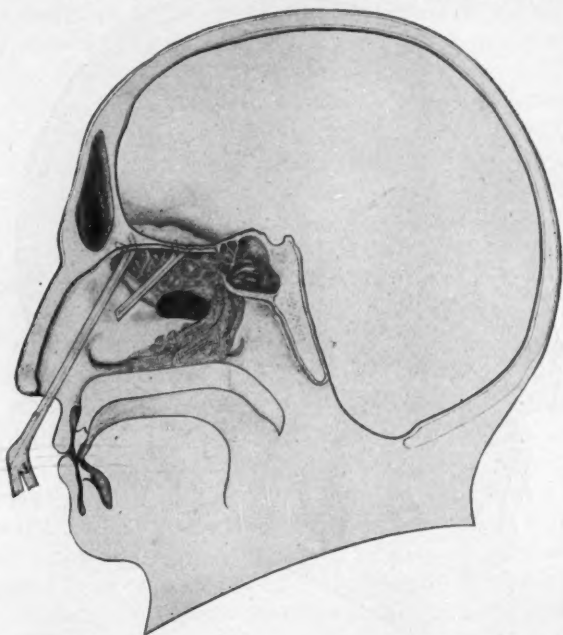


Fig. 3. Ethmoidectomy completed. Large opening in sphenoid. Maxillary antrum opened in middle fossa. Instruments against roof of ethmoid, which is higher than roof of nose. Post nasal packing to prevent bleeding backward.

plate of the ethmoid with the superior turbinate and lower half or two-thirds of the ethmoid cells (see Fig. 1 and 2). In most cases one or more of the superior ethmoid cells have been opened that are large enough to enable the operator to see the roof of the ethmoid, his coveted "land-mark." In those cases that he cannot see the roof of the ethmoid he must fight his way to the roof by gently biting off the most pendulous cells, using the probe to see

that the roof is always higher than the cell that is being removed. From this point the operator follows up the removal of the ethmoid cells forward and backward or vice versa, with forceps adapted in size to engage the cells which are even higher than nasal roof (see Fig. 3). The forceps must be sharp enough to cut cleanly, to prevent pulling or stripping of the muco-periosteum.

The operation should keep in mind that some of the cell attachment is thickened, sometimes almost a ridge forming the be-

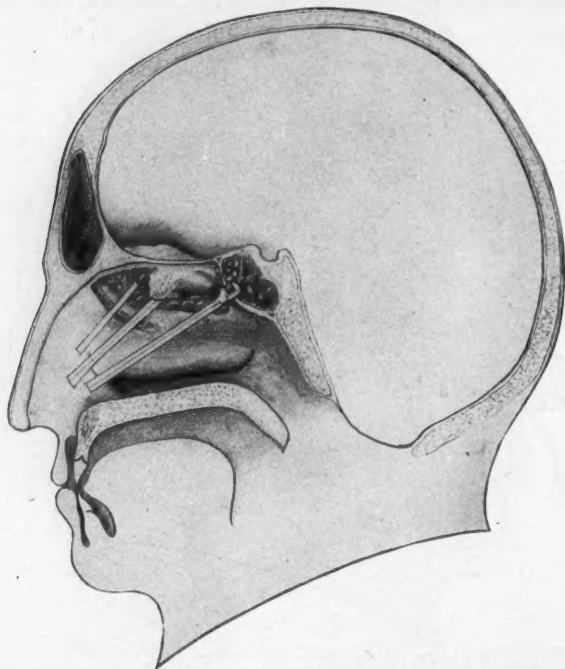


Fig. 4. This shows method of operation when ethmoid is impacted against septum, using 15 degree angle ethmoid forceps instead of ethmoid knife, cutting backward instead of forward.

ginning of the cell wall. This is especially true at the junction of the sphenoid and frontal bone forming the roof of the ethmoid. Here is the key to safety in removing the high ethmoid cells—use forceps that are small enough not to crowd—sharp enough to cut cleanly—always remove the cell proper and not its accessory wall of attachment at the roof—a good rule is to keep from 2 to 4 mm. from the roof of the cell—this will prevent trauma or strip-

ping of the muco-periosteum and the danger of cracking or perforating the roof.

In those cases where a pathological ethmoid is impacted against the septum. The operator can soon become skilled enough to perform the first step of the operation as indicated in Fig. 4. First by removing middle turbinate and enough of the ethmoid cells to probe the sphenoid, next enlarging the sphenoid opening with punches cutting upward and forward, removing any ethmoid cells extending over the sphenoid and into the posterior ethmoid, removing enough of the cells to enable the operator to see the roof of the ethmoid (land mark) Fig. 4. Also shows operation to find the roof of the anterior ethmoidal cells.

After the high ethmoid cells around the infundibulum of the frontal sinus have been removed a curved probe in the majority of cases can be passed into the frontal sinus. This opening is usually sufficient with its favorable drainage to effect a cure. The pernicious habit of curetting the frontal duct into the sinus destroying its mucous membrane should be discouraged—which is exchanging mucous membrane for granulating tissue.

In those cases that do not get well, it will tax the operator's wits to do an intranasal operation to make an opening that will stay open and effect a cure.

The operation for opening the maxillary sinus is well established. If the space is sufficient between the inferior turbinate and orbital wall it can be opened in the middle fossa (see Fig. 3). Does not require any loss of the inferior turbinate which should never be sacrificed where an ethmoidectomy has been done. With a sinus punch that has a small shank at its curve, the turbinate can be pushed up or cut a nick in its center, then the punch can be passed under the turbinate and remove the antral wall in the inferior fossa (see Fig. 2).

Fig. 1 shows ethmoid knife in position ready to make cut forward. The edge of the knife is directed slightly upward which will cause the knife to follow upper dotted lines, especially if the handle is depressed a little as cut is being made. The ethmoid knife is made with three blades, the one in Fig. 1 with a tendency to cut up, one blade that has a tendency to cut down and one blade that cuts straight forward. The dotted lines in Fig. 1 shows the different direction cuts can be made with three knives in removing the middle turbinate—part or all of the ethmoid.

The knife which is on a long shank with a ring for the forefinger is detachable from the handle proper, which is a great advantage in a close nose, as the knife with its small shank can be placed in position. Then the handle with two hooks is placed over the shank of the knife and introduced into the nose until a third hook is anchored at the anterior end of the middle turbinate then with safety one can cut the vertical plate into strips and pieces if desired. The instrument is safe to use and easy to understand.

The sinus punch is one that I exhibited to the Society some six years ago, which has been changed to fit the universal handle and made stronger construction, retaining its size.

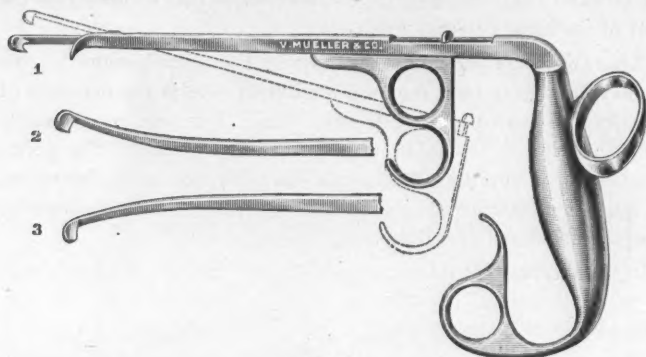


Fig. 5.

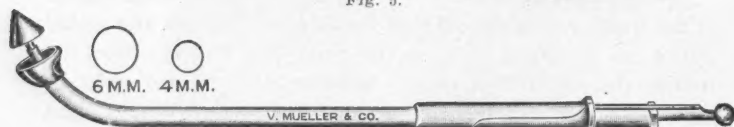


Fig. 6.

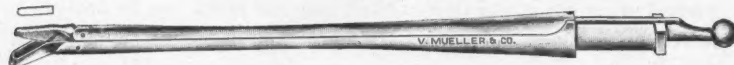


Fig. 7.

Figure 1. Shows ethmoid knife in position. The dotted lines show the variation of the angles of the incisions with the different knives.

Figure 2. Shows first step of operation completed with probes seeking safety land marks. After the incision has been made forward with knife as indicated by the superior dotted lines, figure 1, the ethmoid cells as high as the incision are easily removed by straight nasal forceps. Then the middle turbinate and vertical plate is cut loose from its posterior attachment with forceps or

snare, or any other instrument or technique preferred by the operator. It is the completion of the first step that is important and not the instruments or technique.

Figure 3. Shows a (schematic) complete ethmoidectomy for the relief of Pan-sinusitis. The forceps against the roof after the operation is completed. The sphenoid has a large opening extending to the roof made by removing the ethmoid cells that extended backward over the sphenoid. The walls of the sphenoid and the ethmoid shows the muco-periosteum intact. The frontal duct is patulous. The unciform process can be left in many cases as shown here—which lessens the area of the operation, and is an aid in the new architectural formation of the ethmoid area after the operation.

The maxillary sinus is opened in the middle fossa which does not require any sacrifice of the inferior turbinate which is the distributor of the inspired air upward. Plus these conditions nature abhors a cavity and in a few months seems to pull the ethmoid wall nearer the septum which is covered with by a muco-periosteum that performs the physiological function almost as well as the mucous membrane of the nose.

In my experience if all the infection has been removed, in a few months the new nose apparently is performing its physiological function, the naso-pharynx comfortable and moist, on the other hand, when the dryness of the nasopharynx has increased it usually means there still remains an infection.

To pack the nose causes pain, congestion of the sinuses and danger of a meningitis. To leave the nose unpacked the patient may bleed, giving both patient and operator trouble. To avoid both of the obstacles, a happy medium is found by packing the posterior nares below the operative field extending forward between the inferior turbinate and septum—which makes it easy to remove (Fig. 3).

The patient is not troubled clearing the nasopharynx or swallowing blood, causing nausea. The operative field is not irritated by packing or prevented from draining forward. Should the bleeding become too free the patient is instructed to hold his nose, which usually stops it.

Is the patient a hospital case? Yes. If it is, the only way you can keep him comparatively quiet which will often prevent the pain from the third to the seventh day.

The writer pre-supposes that the surgeon who does the radical operation for pan-sinusitis can easily adopt any of the modified operations for one or more sinuses.

A RADIUM APPLICATOR FOR THE LARYNX.

DR. OTTO T. FREER, Chicago.

The hidden location of the larynx, its mobility, extreme sensitiveness, the cough and retching reflexes unite to make effectively prolonged and accurate intralaryngeal applications of radium most difficult. Nevertheless, after making and changing several instruments for the purpose, I feel that I have at last made a type that satisfactorily holds the radium in surface contact in the exact part of the larynx where it is desired to place it and for sufficiently prolonged periods. This instrument, my intralaryngeal radium applicator, supplements the radium needles of Dr. Frank Edward Simpson which are designed to be thrust into the tissues by a needle introducer devised by me and described by me in the Transactions of the American Laryngological Association for 1918. The needles contain radium or radium emanation and are intended especially for the raying of malignant growths by "cross-firing" from several needles lying from 8 to 12 hours in the substance of the growth. In an article* on cancer of the prostate by Dr. Robert Herbst in the Journal of the American Medical Association, May 31, page 1610, 1919, both the Simpson needles and my introducer are pictured and described without credit to either Dr. Simpson or myself, so that to protect our priority I find it necessary to mention the matter here. For malignant growths of the larynx and vicinity needling is the best method, but there are many intralaryngeal conditions where needling is unsuitable and where surface applications are indicated, such as chronic hypertrophic laryngitis, papilloma of the larynx, amyloid infiltration of the larynx, laryngeal tuberculosis, pachydermia of the larynx, many similar affections and to supplement needling treatment for malignant growths. It is for these states that my intralaryngeal radium applicator has been devised. It is made as follows:

A length of heavy copper wire, No. 16, 38 inches long, is bent upon its middle until the two lengths so created lie parallel and in contact. The radium container (Fig. 1 and 2) of standard make, made by the Radium Chemical Company, Pittsburg, possesses an eye at one end. This eye is now threaded upon and slipped along the wire to the mid bend of the wire. The eye end of the container

*Dr. Gordon B. New, The Laryngoscope, June, 1919.

is then soldered in the bend so that the container forms a straight line with the two parallel lengths of wire. These lengths are then soldered together along their whole length to form a long, flat rod of copper. This rod is reinforced upon its flat sides (Fig. 2, a) by two ribbons of soft sheet brass, 1-32 of an inch thick and 5-32 of an inch (4 millimeters) wide, soldered on with soft solder. The combined brass, copper and solder rod so formed is evenly squared with a file so that it has a rectangular cross-section (Fig. 2, a) and when thus completed is an inelastic, stiff but easily bent rod of soft metal that will keep any angle given it with the pliers. At the end of this rod is the radium container fastened beyond the possibility of coming off and dropping into the trachea by the heavy copper wire passing through its eye. This security would not exist if the container were merely soldered or even brazed to the end of a simple copper rod.

The forehead clamp shown in Fig 1 is now placed upon the patient's forehead and is firmly fixed to his head by means of the broad heavy headband of elastic webbing, to which the clamp is sewed. The rod is now bent by pliers into a shape resembling that shown in Fig. 2 but with such modifications as the patient's dimensions indicate, in order to approximately form the applicator. This is then seized by the wooden thumb-plate (Fig. 2 b) and the radium container is introduced into the previously anesthetized larynx into the desired position, using mirror laryngoscopy. While the radium container is held by the operator in place in the larynx an assistant ascertains whether the upper part of the rod or stem of the applicator will at the same time lie in the jaws of the clamp. If the stem will not do this, the instrument is withdrawn and the bends of the stem are changed with the pliers until the stem will rest in the clamp when the radium container is in the right position in the larynx. The clamp is then firmly closed upon the stem and the mirror is used to see whether the container stays in place in the larynx or springs out of position, or, as sometimes happens, jumps out of the larynx into one or the other fossa piriformis. This is most apt to occur if the patient swallow or retch or if the container has not been passed deeply enough into the laryngeal interior. In some cases, especially where the base of the tongue needs treatment in the hyoid region, the fossa piriformis is the proper place for the applicator.

While the container is in the larynx the patient must not move his head more than a little, for motions of the head, especially rota-

tion, will of course move the container in the larynx with the head, and so may cause coughing and retching. Another source of displacement of the container in the larynx and one that may lift it out of it, is strong upward movements of the tongue made in retching or from nervousness, as the dorsum of the tongue may push the oral bend of the applicator stem far upward. To avoid this

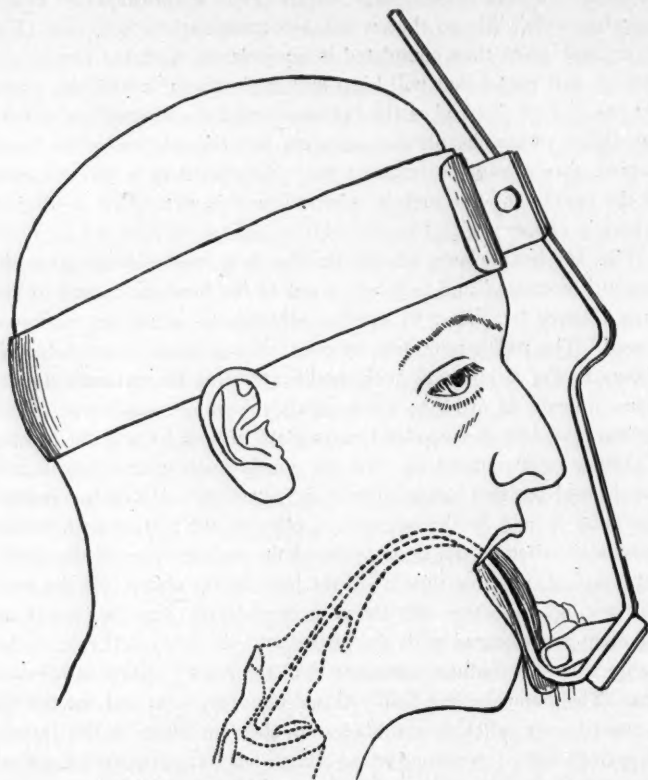


Figure 1. The radium applicator in place in the larynx.

the patient shown in the sketch from life in Fig. 1, kept his tongue pulled out during the treatment which lasted over an hour at each sitting. Since making this drawing, I have altered the oral bend of the stem (Fig. 2) so as to keep it as far away from the tongue as possible, following the roof of the mouth to the posterior pharyngeal wall. Repeated treatments make the larynx very tolerant and

longer and longer radium applications may be made with less and less local anesthesia. During the first treatments there may be a copious flow of saliva so viscid that it may need to be removed with an electric pump, as the usual dental saliva ejector is too weak to take up the thick spittle produced.

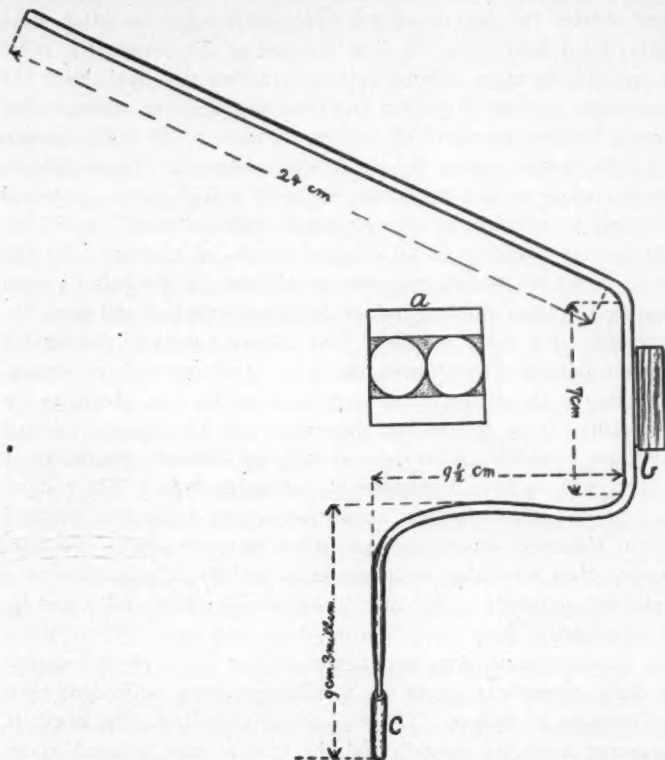


Figure 2. The radium applicator with standard bends to be altered to fit individual patients; (a) enlarged cross section of the stem of the applicator showing the parallel wires and the brass ribbons soldered together. Natural size diameter, 5-32 of an inch or 4 millimeters; (b) wooden thumb piece for holding applicator in its introduction; (c) the radium container.

For the local anesthesia I use a ten per cent cocaine spray reinforced by the application of a mud of pure flake cocaine with a laryngeal applicator to the place where the container is to rest. During the treatment an occasional spray from the cocaine atomizer may be needed to keep the reflexes from waking up, and in order

to reduce the amount of cocaine used it is supplemented with the insufflation of anesthesia powders at intervals.

While in the case of treatments to the surface of the body the use of small amounts of radium may be compensated by increasing the time of its application, the matter is different in the larynx where, to minimize irritation, lessen the amount of cocaine needed and shorten the fatigue of the rigid position for the often weak patient it is desirable to cut short the time of the treatment as much as possible by using as large a dose of radium as is available. The maximum amount of radium in effectively screening capsules that would fit into the standard radium container is 25 milligrammes, 15 milligrammes being the usual screen content. To be able to employ more radium than that, up to 50 milligrammes, protected properly by sufficient screening against radium "burns," would necessitate the making of an especial screen of platinum, for the usual screen for 50 milligrammes would form far too bulky a mass for the laryngeal interior, and would create irritation and some obstruction. For these reasons I have not used metallic radium for the intralaryngeal treatments but have employed radium emanation, that is, the gas given off by radium and its salts, obtaining the emanation from the radium laboratory of Dr. Frank Edward Simpson. To make emanation in sufficient amounts practically, it is necessary to have a gramme of radium or more. The radium is kept in a safe while the emanation arising from it is pumped by an elaborate apparatus, a so-called mercury pump, into narrowing glass tubes that terminate in a capillary tube as thick as a fine cambric needle. This tube is sectioned by heat and sealed by it into lengths about three-fourths of an inch long. Nevertheless one of these lengths may be made to contain up to 400 millicuries, as their strength is measured, a millicurie being equivalent to a milligramme of radium. The dose of each capillary tube length is measured as to its strength and the tube is then inclosed in an enameled silver screen to go inside the outer screen or container described. The average dose used by me was about 50 millicuries, but, had there been need, a hundred or more could have been forced into one tube for an especial patient. The average time used for a single treatment was from one-half of an hour to one hour. Using these effective doses results were obtained in twenty minutes that could only have been partly had from an hour's treatment with 15 milligrammes of radium. In addition, as shown by Finzi, the effect of a large dose of radium given at one time is

greater than the effect of the same dose subdivided into a number of treatments.

Nevertheless, those having the non-malignant affections of the larynx to treat with radium should not be deterred by the lack of emanation if a dose of radium suitable to enter the container is the only thing available. A prolonged course of treatments would, however, be necessary, with a much delayed result.

Dr. Simpson is having slightly larger especial containers made that will hold two of the silver screens that hold the emanation tubes instead of only one as is the case with the standard containers. This will double the effectiveness of the raying, so that even ten-minute treatments will be enough in some cases. In malignant growths, though at least one needling is indicated, additional raying with the laryngeal applicator will tend to prevent relapses and extensions in the surroundings of the tumor and so prolong and reinforce the effect of the radium needling.

The production of the radium applicator is too recent to permit a series of case reports nor are they necessary, as it is merely a means of prolonged and accurate application of radium or its emanation. I will mention one case here as an example of what may be accomplished. A man, aged 65, with a carcinoma of the left aryteno-epiglottic fold with beginning deep infiltration of the hyoid region from behind, refused radium needling so that the radium applicator alone could be used. When first seen the patient could not swallow solid food and took liquids only with effort. He had severe radiating pain in the throat that kept him awake at night, had lost his sense of taste and was very weak from lack of food and sleep. He was given six hours of raying with the applicator, the individual sittings being at long intervals and lasting only one half of an hour each on account of his weakness. The treatments spread over two months and now he can swallow normally, his sense of taste has returned and the tumor is so reduced in size that it looks merely like a somewhat swollen aryteno-epiglottic fold. As shrinking of the tumor gradually exposed the previously hidden left vocal cord to view, the cord was at first seen to be immobile, but now is as freely movable as the right cord and the laryngeal interior at the level of the glottis looks normal. The patient is still under treatment.

Those wishing duplicates of my applicator may have them made to order by applying to F. A. Hardy and Co., 10 South Wabash Avenue, Chicago.

Addendum.—Since writing the above I have made a radium applicator of the form described but using a copper tube 3-16 of an inch, outside diameter and 1-8 inch caliber instead of the composite rod described, the idea being to use the applicator itself as a suction tube to keep the larynx free from secretion for those patients whose copious flow of saliva overflows into the laryngopharynx causing strangling and retching. The lower end of the tube opens just above the radium container and the rubber tube that connects this tubular applicator with the vacuum bottle of the suction pump is attached to the upper end of the tube. After being hammered flat the copper wire that holds the container is soldered to the sides of the copper tube in a groove cut longitudinally in both sides of the tube. The copper wire so attached extends as far as the handle of the applicator only. This instrument gave a patient, who was constantly retching as the result of saliva collecting in his throat, such perfect ease that the treatment could be conducted without the least interruption and with great relief to him. The copper tube is sufficiently bendable to permit such adjustments as are needed. To keep the mouth free from saliva a common dental saliva ejector with suction from the water supply was also employed simultaneously with the electric pump attached to the tubular applicator.

25 E. Washington St.

A CASE OF TRAUMATIC SALIVARY FISTULA

DR. SEYMOUR OPPENHEIMER, New York City.

Cases of traumatic salivary fistula, as a complication of the mastoid operation, are sufficiently unusual to warrant the reporting of the same. The difficulties attending the cure of this condition in cases not dependant upon obstruction of the salivary duct are many.

J. S., aged 7 years, had an acute mastoid operation performed four years ago, following an attack of measles. The post auricular wound was healed but discharge continued from the middle ear. Two years later it became necessary to perform a secondary mas-

toid operation. This procedure as well failed to check the tympanic suppuration. After the healing of the mastoid wound, there was noticed at the lower end of the incision, a pin point opening through which escaped intermittently quantities of watery material, at times being very profuse; the opening was too small to admit of the finest probe. This was the condition present at the time of the case coming under my observation.

Considerable muco-purulent discharge was present in the middle ear and granulation masses were springing up at various points. Much of the drum membrane and ossicular chain was absent. The process in the tympanic cavity has been well controlled by local treatment, but the faintest discharge being present, and that only at intervals and of mucoid character.

The explanation of the fistulous channel, I believe to be due to the dividing of one of the ducts of the salivary gland, by too sharp traction of the retractors. The difficulty of healing such a fistulous channel through which saliva flows so freely particularly on mastication due to the constant bathing of the walls of the sinus with salivary secretion thus preventing union. The actual cautery is usually suggested to cure this condition, which cure is brought about by the induction of an acute inflammation in the secreting cells of the gland and at the same time an adhesive inflammation in the walls of the sinus, that obliteration of the sinus by adhesions may be effected before the cell of the gland resume their proper function by the abatement of the inflammation affecting them. While it is true the actual cautery induces such an inflammation both in the cells of the gland and in the wall of the sinus, but it does more, it kills that tissue it touches and before union can occur the slough must come away and by this time the function of the secreting cells is re-established and the same state of affairs exists as before the use of the cautery.

45 East 60th St.

WOODY PHLEGMON WITH REPORT OF CASES.

DR. HARRY L. POLLOCK, Chicago.

In 1896 Paul Reclus described a new clinical pathological condition heretofore unrecognized and designated by him as phlegmon lingeux. It is characterized by an infiltration of the tissues of the neck and overlying skin; board-like to the touch, very chronic in its course with sharply defined borders, painless and never accompanied by any signs or symptoms of an acute inflammatory process. He cited five cases which he had previously treated and gave the detailed histories of each patient.

Following this report it was presented by various German authors under the title of *holz phlegmon* and by English writers as *woody phlegmon*.

In looking up the English literature in this subject, one is surprised by the small number of papers alluding to this subject. In searching the various standard text books on surgery, I find it casually mentioned in Keen's Surgery, in Tillman's and in General Surgery by Lexer and Bevan, and in De Costa's Surgery it is gone into quite extensively. While the occurrence of this disease is quite infrequent, it is of sufficient importance, that all of us should familiarize ourselves with the diagnosis and treatment, and especially the differential diagnosis between this disease and several of the chronic conditions with which it might be conflicted.

Judging from the cases cited in the literature, it usually occurs in adolescence, more frequently in those who are undernourished, although it does occur in the young and robust. In fact Tichtner of Leipsic describes several cases of a milder variety which affected children and young adults only.

The disease runs a very chronic course and usually affects the tissues of the neck, although it may occur anywhere in the body, several cases of woody phlegmon having occurred in the abdominal wall and some in the legs, and one of the cases which I have seen affected the lower leg and foot. We, as oto-laryngologists, being interested only in the disease as occurs in the neck, I shall confine my discussion to this particular phase of the subject.

The first symptom which presents itself, is a swelling either at the angle of the jaw or in the submaxillary gland. The swelling increases slowly; is not painful nor accompanied by any sign of an acute inflammation such as chills, fever nor redness.

The gland at times remains swollen for quite a long period—sometimes as long as six or eight weeks and gradually the swell-

ing which now becomes edematous, extends down the side of the neck, not stopping until it reaches the clavicle and extends from the mid-line of the neck posteriorly until the trapezius is reached. As the swelling progresses, it becomes more firm and board-like in its consistency, hence the name woody phlegmon. The overlying skin becomes firmly attached to the subcutaneous tissues and assumes a dark reddish hue. At no time is there any great amount of pain, neither spontaneous nor upon deep pressure. On account of the firm attachment of the skin, subcutaneous tissue and muscles, there is a restriction of the various movements of the head simulating the restricted movements of a torticollis. There is also difficulty in deglutition, and on this account the patients emaciate quite rapidly. There is at times interference with respiration and frequently it is necessary to do a hurried tracheotomy on account of the edema of the larynx. Reclus' second case which he reports succumbed in a very short time to edema of the larynx. During the progress of the disease, which extends usually over a period of several months, small superficial skin abscesses occur, which may open spontaneously; even these may cause little or no pain. The contents of these abscesses are sometimes quite clear, but usually filled with turbid fluid.

The full development of this stage requires anywhere from six to ten months. At the height of the disease, the entire (not always unilateral) side of the neck is hard as wood, and cannot be confounded with any other condition. The difficulty of the diagnosis of which I will speak later, is usually in the earlier stages, before this typical picture is presented. The disease terminates either in a gradual resolution and recovery or in death, either from edema of the larynx or by gradual exhaustion.

Pathology. The exact etiology is not yet clear, but most authorities agree that it is a very low grade infection, not of sufficient degree to cause a breaking down of the tissues but merely causing an infiltration of the connective tissue and a secondary contraction of same, thus causing the peculiar characteristic hard board-like swelling.

From the small abscesses and often direct from an incision into the mass, we are able to recover various pus organisms. Reclus as well as others recovered a diplococcus which occasionally grew in small chains. In one of his cases Reclus isolated a diphtheroid bacillus, from which a vaccine was made, and employed with great success, the patient recovering in much shorter time than in the other cases.

However, no special bacteria have been recovered in all cases, so that we might isolate any particular one as being pathognomonic.

Owing to the fact that the tonsils, teeth, gums and mouth harbor a great number of bacteria, the infection is supposed to originate somewhere in this region and carried by the lymphatics to the neck, which we all know are well supplied by the lymphatic system. However, the bacteria are of such a low grade that they do not set up an active inflammation and cause deep-seated abscesses, but, as described before, they cause rather an infiltration of the various structures of the neck, which by secondary contraction bring about this wood-like swelling.

Pathology. If we examine a piece of this tissue microscopically, what do we find? This depends somewhat upon the region from which the specimen is taken. If we obtain a section through the submaxillary gland we of course find evidences of a chronic inflammation, which is shown by an increase of the connective tissue stroma, and an infiltration of leucocytes. Owing to the epithelial lining of the tubules, one must be careful not to mistake these epithelial cells, often cut at various angles, for a carcinoma. If we cut through the structures in the neck, there is a firm tissue which is very fibrous. Microscopically there is nothing seen, except an increase in the connective tissue. While this disease *per se* is not a malignant one, yet there are true cases of carcinoma or sarcoma of the larynx or pharynx in which this hard board-like swelling occurs, somewhat obscuring the diagnosis. This condition presented itself in the first case which I will report.

The diagnosis when the disease is fully established is comparatively easy. The board-like feeling, absence of pain and temperature, the difficulty of active movements of the head, the deep reddish purple discoloration of the skin cannot be mistaken for anything else. In the earlier stages the disease is often mistaken for malignancy, either carcinoma or sarcoma, but a careful microscopical examination must disclose the malignancy. Actinomycosis must also at times be differentiated, but a careful examination will disclose the Ray fungus.

The prognosis is usually good. Tichtner reports that all his cases recovered. Judging from all the literature which can find, including the following: Reclus, Krause, Fichtner, Sick, Long, Jenney, Kusnetzoff, Muchsam, Merkle, Powers, Grant, Worthington and others, I should say that 75 per cent of the cases recover. The prognosis depends whether resolution occurs or whether the process continues and death ensues, either from edema of the larynx or from gradual exhaustion due to slow starvation on account of the interference with deglutation.

Treatment. Two things must be taken into consideration in the management of these cases. First, the strength of the individual

must be kept up, by feeding, tonics, etc.; second, everything must be done to promote resolution. This consists in multiple incision all through the affected areas. Hot, moist compresses, applied over the entire affected region, is also beneficial. Some have advised to attempt a dissection of the entire mass, but the best results have been obtained by multiple incision in various portions of the tumor.

Dr. Joseph C. Beck and I have had five cases, three of which recovered and two died. I will report the first and fifth cases, both of which were fatal.

Case 1. Mr. K—, January, 1911. Comes complaining of difficulty in swallowing and speaking. Voice is muffled. Noticed also that during the past year this swelling has been present only on the right side, below the angle of the jaw. States his tonsils were sore four months ago, at which time he consulted a physician, who made an incision into the tonsil without relief to his condition.

Examination. Nose negative. *Mouth.* Oro-pharynx and larynx negative. *Right Ear.* Shows evidence of scars from old healed-out suppuration. Swelling present about the size of a walnut, quite movable, not painful below the angle of the right jaw, running forwards and towards the submaxillary region. Other physical examination negative.

Although no history given antiluetic diagnostic treatment was administered (Cypridol). The growth externally gradually increased, spreading along the side of the neck toward the hyoid bone in back into the scalenous region. Along with this the voice became very much thicker. The skin over the entire swelling appeared to take on the appearance of a dark red color and to the touch did not seem painful nor fluctuating. Pharyngeal, laryngeal and base of the tongue examination still negative, and in view of the fact that antiluetic treatments, including X-ray, gave no results, we decided to incise it at the point which was most significant of fluctuation. Following this, bleeding was profuse, but no pus expressed. A culture was made from the blood without any growth. After inserting a drain, moist, hot compresses were applied and patient was relieved from the thick feeling in the throat. A piece of the tissues was taken from the region of the neck and subjected to microscopical examination. It showed nothing but round-celled infiltration.

The subsequent course of the patient was, swelling increased and greater endurance, and not only on the right side of the neck, but extending to the left.

About four weeks later patient suddenly developed a swelling within the larynx in the region of the epiglottis. Excised a piece and same subjected to microscopical examination, which proved it

to be adeno-carcinoma. From that time on the patient grew gradually worse, so that shortly after a tracheotomy was necessary, and while he ran the usual course of carcinoma of the larynx, it was complicated by a very unusual secondary involvement of the neck unlike that usually seen in carcinoma. That is, the woody phlegmon continued to the last. Patient kept getting worse and finally died of exhaustion.

Case 2. On December 30, 1918, I received the following letter: "I am referring a patient to you by the name of Mr. G. He expects to arrive at your hospital tomorrow morning, January 1, 1919. He has, what I would say, a carcinoma of the neck. He has been operated on several times, has had some few X-ray treatments and several applications of radium, but without any results. The surgeons who have operated and used the X-ray have given him very little encouragement."

January 1 Mr. G. presented himself, and the following history was obtained:

Age 59 years. Ever since he can remember has been troubled with scrofulous glands, which break down and suppurate, then heal spontaneously. About one year ago a dentist who was making a partial lower plate for him, tried to force same into position, when he heard something crack in his lower jaw on the left side. This caused some pain, which persisted for several weeks. He never returned to the dentist on account of fear of having his jaw injured again. Six months ago noticed a swelling just below the angle of the left jaw. It was not painful nor tender; consulted a surgeon who pronounced it cancer and advised an immediate operation. This was done in August. Shortly after this a swelling appeared on the right side at the angle of the jaw, which ruptured spontaneously. This swelling has opened and closed several times, always discharging pus. About this time the swelling began to involve the entire left side of the neck, which became stiff and hard, but never painful, nor was there any fever. Has been treated by radium and X-ray a great deal.

Examination. Nose in normal condition. Is wearing a complete upper set of teeth. The incisors and canine teeth are present, but show evidence of pyorrhea. The teeth in the right half of the lower jaw present, but the cuspids and molars absent on left side. Tongue freely movable. Tonsils small, submerged, not degenerated. Slight infiltration of the floor of mouth on left side, adherent to the deeper structures of the neck. There is a scar under the chin extending from the angle of the left jaw to the same position on the right jaw. At the end of the incision on the right side is a fistula, which extends upwards to the jaw, from which a thick,

clear mucoid secretion exudes; this probably being saliva. The entire left side of the neck from the jaw to the clavicle, and from the mid-line of the neck to the trapezius muscle is hard, sharply outlined and resembles a board. There is no tenderness, except in the area of the fistula. He is robust and well nourished, neck is stiff and in attempting to move his head he must turn his body.

Larynx. Normal. X-ray shows a thickening of the inferior maxilla near the angle, probably an osteitis or periostitis. Blood examination shows a plus Wassermann and practically normal differential count.

At the time of the removal of the gland, a portion was submitted to the laboratory and the following report returned: Mostly granulation tissue, no evidence of malignancy. I had a compliment fixation test made for tuberculosis, which was negative, as was also an Aberholden test for carcinoma. I made a diagnosis of woody phlegmon, and as he was unwilling to remain in the city, returned outlined above. In four weeks he returned somewhat emaciated and having some difficulty in swallowing.

home with instructions to his family physician for treatment as

I suggested to his physician that I believed the fistula, which was still annoying him, was due to the submaxillary gland and advised complete removal of same, and at the same time obtain another specimen for microscopical diagnosis.

On February 1 removed the right submaxillary gland, and took a small piece of tissue from the region of the left submaxillary gland also. The wound healed rapidly and he left for his home a few days later. The microscopical report showed, in one section, a neuro fibroma, in section two and three only fibroma, consisting of connective tissue with considerable round cell infiltration.

On May 1, 1919, I received the following from his family physician: "I wish to inform you as a matter of record that Mr. G. died April 22, 1919. The wound in his neck healed nicely. He was unable to eat solid food and finally could not take liquids. The trouble seemed to spread and involved the entire neck.

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THE FALLING REACTION OF ACROBATIC AVIATORS.

DR. ROBERT J. HUNTER, Philadelphia.

Thinking it would be of interest to see if aviators show any change in the falling reaction, after experience in the air, I have studied a few cases with that in view.

The men were stimulated in the vertical canals only, as they are the ones involved in loops and tail spins, and would show the most marked change, if any.

The technique was the standard used in the Air Service; head on the clenched hands, which in turn rested on the knees. The angle quoted in the figures was made by projecting it from the center of the seat, at the back of the turning chair, to a board fastened on the head rest. As the head rest was moved up and down to adjust it for different heights, the angles are not absolutely correct.

For the benefit of those not interested in otology, I might explain that stimulation of the semi-circular canals by rotation causes nystagmus and a sensation of turning, after the chair is stopped. A normal man can point to an object, with his eyes shut, after he has felt it, but after rotation, instead of pointing to the object he makes an error in the direction, opposite to that in which he feels he is turning. The reactions are constant and specific for the various canals, which may be by proper methods, individually examined. For the horizontal canals, the shoulder group of muscles is used and the error called past pointing; for the vertical canals the back muscles are used and the error is falling to one side.

Twenty-seven men were turned, eleven were instructors in acrobatics, varying from 35 to over 600 hours of acrobatic flying. Their total flying varied from 170 to 1,800 hours, giving an average of 514 hours. Their average degree of falling was 2.9 degrees. The least response was shown by the man who had the second longest experience and the greatest deviation was shown by a good pilot, who asked to be excused, because he had just had a tooth pulled, and felt as he expressed it, "all in."

Another group of five aviators, selected at random, was examined. Their experience in acrobatics varied from 10 to 20 hours;

*Read (by invitation) before the Section on Otology and Laryngology of the College of Physicians of Philadelphia. May 21st, 1919.

their hours of flying from 85 to 175, giving an average of 121 hours. Their average degree of falling was 6.7 degrees. Eleven ground men were then examined. For most of them it was their first experience in the rotating chair. They had had very little experience in the air. One man had never been up. The most experienced had, had 15 rides in the last 16 months. The average degree of falling was 20.6 degrees.

The difference between the experts and the untrained men was very marked and showed, without doubt, that men used to air work give less response to the falling test, than ordinary men.¹

Rapid rotation of the body causes vertigo. We may define vertigo as a false sensing of motion. Past pointing is a physical sign of vertigo, in that the subject compensates in pointing for the rate of movement that he feels. Thus we might conclude that the degree of past pointing may be taken as an indication of the amount of vertigo. I think that this is relatively true when the subject has not had any acrobatic experience, but where evolutions are performed frequently, the subjects learn to overcome the effects of vertigo and keep their equilibrium, even though they feel that they are falling or turning. We should consider the question, whether the sense organs in acrobats become accustomed, through training, to the rapid turning and no longer produce vertigo. Whirling dancers studied by Lieutenant-Colonel Eugene R. Lewis, M. C., U. S. A., in the investigation preparatory to his paper,² all maintained with one exception, that in spite of the fact that they had engaged in these exhibitions for many years, they always had vertigo. The one exception bumped into one of the wings, at the conclusion of his stunt, shortly after stating that he never became dizzy. These performers, when examined in the turning chair, had nystagmus of normal duration. The duration of after turning nystagmus in Army Aviators as reported by Fisher and Babcock,³ and Levy,⁴ is normal. Levy also notes less violent falling reaction in aviators. K. Dunlap,⁵ finds that nystagmus is less after repeated turning. His work is refuted in Fisher's article.⁶ Observations by myself during the examination of several hundred expert aviators, would show that nystagmus is of normal duration. Examination of tight rope walkers by me, gave normal turning reaction and nystagmus. I found a man with subnormal responses who had formerly been a trick cyclist, and who maintained that that was sufficient evidence of a normal balance sense. He had a plus four Wasserman. I could not determine from the history whether

infection had occurred while he was still engaged in cycling or afterwards.

I did not examine the nystagmus in the group of men quoted in the experiment, but many of these men had been examined at various times and the duration found normal. I took the man who showed the least falling reaction and noted his response to the slightest degree of rotation, accelerating speed, maintained speed, slowing speed and sudden stop, and found his responses entirely normal, to the great amusement of his fellow instructors, when they heard the "bell wether" of the stage with eleven months of exclusively acrobatic flying, saying, "stopped, stopped, stopped," while he was really whirling at full speed. It would have been of interest to measure the duration of vertigo after turning in the entire group, and the degree of past pointing after stimulation of the horizontal canals, but numerous duties in the field prevented me from doing so.

As past pointing is entirely a voluntary act, it appears that through training, these men have learned to ignore the excessive stimuli, and sit up straight in spite of the fact, that they feel that they are turning. It may be that their tactile, muscular, articular, tendinous and deep sensation tracts, have become highly trained and they get instant information from the seat of the chair, helping orientation. It is a common observation in examining men for their sense of motion, that any auditory or visual stimuli, will immediately help them to orient themselves and correct the false impression, given by excessive stimulation of the labyrinth. The question arises how are we to determine that a man is normal if he fails to fall?

We should rotate him ten times in 20 seconds and measure the duration of vertigo, which should be 16 to 36 seconds, having him keep the head 30 degrees forward, eyes closed, then rotate him with the head on the knees 5 times in 10 seconds and note the presence of vertigo. We can also tell, that these men are getting stimuli through, by watching them when they sit up or when they past point, and we will see a swaying to one side, of a past pointing on raising the arm, which is overcome on the way down.

Conclusion.—Slight falling to one side, or even the ability to sit up erect with closed eyes,⁷ after stimulation of the vertical canals by rotating the chair 5 times in 10 seconds or even 5 times in 5 seconds, is present in acrobatic aviators. Other individuals fall markedly to the side of rotation.

By close observation a skilled observer can see that muscular effort is being used to overcome the tendency to fall. By timing the after turning vertigo we can determine that the tracts are normal.

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1825 Chestnut St.

FOREIGN BODY IN RIGHT INFERIOR BRONCHUS; REMOVAL

DR. ELBYRNE G. GILL, Roanoke, Va.

Patient, Ida F., age 50, was referred to me February 19, 1920, by Dr. B. L. Taliaferro, of Catawba Sanatorium. Patient gave the following history: Seven years ago the patient was struck in the left temporal region by an axe which rendered her unconscious. Since that time at various intervals she has been subject to attacks of epilepsy. Five years ago during an epileptic seizure patient fell and struck her head upon a cement floor. A plate of false teeth was broken and a small portion of the plate was never found but the patient and her family dismissed it as being lost. Shortly following the accident the patient began having an itching and tickling sensation in her throat which gradually developed into a cough and became steadily worse, more so at night. Eighteen months after this injury the patient was bending over in order to clean out a spring house. At this time she had a hemorrhage. She has had hemorrhages at various intervals since but only when stooping over. Last fall the patient's chest was X-rayed at the Catawba Sanatorium, Va., and the presence of a foreign body was discovered in the right bronchus. The patient

was then questioned as to the history of having aspirated a foreign substance into her lung. She then recalled having broken her false plate five years before and that a small portion of it was lost at the time of the accident.

I referred the patient to Dr. J. T. McKinney of this city for further X-ray examination and the following is Dr. McKinney's report: "Stereo-Roentgen examination, with antero-posterior and postero-anterior plates of Ida F.'s chest shows: A foreign body more or less oblong in shape, about one and one-fourth cm. by 1 cm. in size, lying obliquely in the inferior or descending branch of the right bronchus. The foreign body is lying opposite the ninth rib using posterior markings, and opposite the fourth interspace using anterior markings. There is considerable pathology noted at the base of the right lung, involving to some extent the parenchyma of the lung, a few small emphysematous areas being present. There is a marked peribronchial thickening and fibrosis of the branches of the descending bronchi. The possibility of there being a few adhesions around this foreign body should be taken into consideration. No definite areas of tuberculous infiltration are seen in either lung."

The following is the report of Dr. B. L. Taliaferro, physician in charge of Catawba Tubercular Sanitorium, Va.: "On admission to the sanitorium she gave her history as follows: Usual disease of childhood; good recovery. Has had hay fever, otherwise negative. Was perfectly well until five years ago. Illness began with tickling in throat, bad cough, profuse expectoration, small hemorrhages, loss of strength, night sweats with moderate rise of temperature at times. This patient was diagnosed as having tuberculosis and was admitted to Mt. Regis Sanitorium. I have no record of her exact stay at Mt. Regis but I think it was at least three weeks. She was then admitted to Catawba Sanitorium April 2, 1919. Physical examination showed a few fine râles in right apex with slight broncho vesicular breathing and slight increased whispered fremitus with dullness. In the right back she had a few scattered râles from the third to the sixth dorsal spine. On admission her sputum showed positive gaffky two. The day after admission she had a pulmonary hemorrhage of about a dram of blood. She continued from time to time to have heavy streaks or slight hemorrhages, none of which exceeded an ounce during her stay here. Cough severe and expectoration profuse in the morning. During the rest of the twenty-four hours, cough and

expectoration slight. She had several convulsions which were probably epileptic in character. This patient was kept in bed almost continuously on account of her tendency to hemoptysis. Her symptoms did not appear to improve after several months continued rest in bed but on the other hand her expectoration increased in amount. The profuse expectoration and the slight physical findings led us to believe that possibly this patient had a deep-seated cavity or a bronchiectasis and she was advised to have stereoscopic X-ray plates taken. The X-ray showed a foreign body in right lung behind the fifth rib. This body appeared to be something over a half of an inch in diameter and gave the appearance of possibly being a flattened bullet of about a thirty-two caliber. On close questioning the following facts were brought out which the patient did not give in the history on admission. She said that about seven years ago she was walking behind a man who was cutting wood and was accidentally struck over the right eye by the pole of the axe. And since that time she had been subject to fainting spells which we had diagnosed as epilepsy. And that about five years ago in one of these attacks she crushed her plate of false teeth. After the attack was over she felt as if a part of this plate had lodged in her wind pipe and that her cough and expectoration dated from about that time. Repeated examinations of her sputum were constantly negative except the first examination which was made on admission. The patient was advised to have an operation performed to have this foreign body removed."

On February 29, 1920, I sent the patient to the Lewis-Gale Hospital and on March 1, 1920, under ether anesthesia, I removed the foreign body from the right inferior bronchus. Time of the operation was ten minutes. I used the Jackson adult bronchoscope and Jackson's alligator rotation forceps for extracting the foreign body. The adhesions surrounding the foreign body were very adherent and when the foreign body was pulled away a slight hemorrhage followed. I am greatly indebted to Dr. J. T. McKinney for his accuracy in locating this foreign body and for the skillful manner in which he used the fluroscope at the time of the operation. Patient had a slight hemorrhage following this operation, also a slight elevation of temperature for two days. Since that time her recovery has been uneventful and complete. The uncontrollable cough from which the patient suffered for the past five years disappeared the second day following the operation, not to return.

612 MacBain Bldg.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON OTOTOLOGY.

December 12, 1919.

DISCUSSION.

DR. DENCH said he had been deeply interested in the papers presented by the three authors. So much had been said and it was all so true, that little could be added. Referring to Dr. Eagleton's remarks about brain abscess frequently occurring as the result of otitic infection, he cited an instance in which the abscess occurred in the Island of Reil following an acute otitis. The abscess did not manifest itself until after the second attack, which came ten years later. On exploring the abscess a distinct limiting capsule was found. This bore out Dr. Eagleton's statement that in a very large proportion of cases one has to deal with a primary thrombosis of a vessel which may involve the brain tissue either close to or at a great distance from the originally involved area. As to a chill, occurring in the early stage, he had no records of that, although he had records of all the other symptoms of an acute infection—elevation of temperature, rapid pulse, general malaise, and the general symptoms of a lesion located in the cranial cavity—headache, vomiting, etc., which come on later.

He had been much interested in what Dr. Eagleton said about the inception of a subdural abscess, and cited an instance in which a patient had an acute mastoiditis and later had some symptoms which pointed to a lesion below the tentorium. The assistant surgeons thought the man was malingering, and were inclined to turn him away, but Dr. Dench saw the case and had the man admitted to the wards, and later made a diagnosis of cerebellar abscess, opened the dura in that region and punctured the cerebellum; no abscess was found, but there was a discharge of turbid cerebrospinal fluid, representing Dr. Eagleton's first stage of subdural abscess. A sub-occipital decompression was then done and the wound was closed excepting the lower third of the mastoid wound, and the patient made a complete recovery. That was probably the beginning of a case of what Dr. Eagleton called a subdural or subarachnoid abscess.

Referring to Dr. Eagleton's remarks about dilatation of the opposite ventricle and obliteration of the ventricle on the same side, Dr. Dench said that of course he was aware that dilatation of the ventricles always occurs, but that the obliteration of the homolateral ventricle was a new thought to him. From the conditions he had found on the table, however, he felt that Dr. Eagleton's explanation was correct, and he was glad to hear it. Dr. Eagleton had stated that these abscesses frequently followed the radical mastoid operation. That had not been his own experience. In his personal experience he had had five cerebellar abscesses. He had performed nearly 800 radical operations and had seen only one cerebellar abscess following a radical and one following a mastoid, and a third case in which the mastoid operation was undoubtedly subsequent to the cerebellar abscess, so that it seemed unjust to let that impression stand. Certainly if it were correct he should have seen more than three abscesses in nearly 800 cases of radical operations, and yet that was all he had seen.

Nothing had been said in any of the papers about the value of the differential blood count in the diagnosis of brain abscess, yet that had proved of great value to him. Where there is pus in the brain there is nearly always an increased polymorphonuclear count, and he relied very much upon that finding. In one case that terminated fatally he had not appreciated the importance of the blood count, but since then he had found it of great value in every doubtful case of brain abscess. In one instance

a young man had had a radical operation and an infected wound. He had a high temperature and became paretic in both upper and lower extremities, and brain abscess was suspected. The wound had been grafted primarily, but the packing was taken out and the subtemporal infection was drained. When the house surgeon dressed the wound there was an almost uncontrollable hemorrhage, the source of which could not be traced. A lumbar puncture was made, and they found over 700 cells and a blood count showed a polymorphonuclear percentage of 85. As soon as he came out of his condition of hebétude he had a typical aphasia. The superficial wound was so badly infected that it did not seem wise to explore through the infected area, unless absolute certainty of a brain abscess existed. By that time he had a polymorphonuclear count of 65 per cent, and the superficial suppuration cleared up under Dichloramin-T; his blood count and spinal fluid count became normal, and his aphasia cleared up, and he was discharged from the hospital. When seen last week he was absolutely normal. In this case the diagnosis was made on the basis of the differential blood count, and it would have been criminal to explore the temporal lobe. The abscess, if present, must have been in the acute stage, and with the gradual falling of the polymorphonuclear count it seemed impossible that he should have a brain abscess.

Dr. Dench said that he agreed thoroughly with what Dr. Eagleton had said about exploring these cases; but when we have intracranial lesions we must make a differential diagnosis or a lot of harm would result: If operated upon too late, the patients would die; if operated upon too early they would be pretty certain to die. In another case seen recently the patient had an increased polymorphonuclear count, a temperature of 105° and choked disc. A colleague was confident that it was a case of brain abscess and urged operation. The patient had a spinal fluid count showing 30 cells. The polymorphonuclear blood count was 70. She had a remission of temperature to 103°, with a chill, and Dr. Dench negated the idea of exploring for brain abscess. The next day her spinal fluid had fewer cells; it showed 30 the first day, 25 the next. She then had a little rigidity of the neck, and her differential count was dropping, 65. The next day her temperature was 100°, and she had a severe chill. He then operated, drained the mastoid, resected the internal jugular vein, and cleared out the clot from the sinus, and the patient is doing perfectly well. Had he followed the suggestion of doing an exploratory operation, he certainly would not have exposed the jugular, but would have done a decompression operation. The case was cited to show that one must have some definite plan of procedure; one would lose almost as many cases by doing a shotgun operation as by waiting what sometimes seems a considerable interval attended by great anxiety to both physician and patient. Ultimately we shall get better results if such patients are not operated upon until a fairly exact diagnosis is made.

As to the frequency of cerebellar as compared with cerebral abscesses, Pitt, as reported by Ballence, states that the cerebellar type outnumbers the other four to one. Dr. Dench said that in his experience the proportion was the same, only just the other way, four or five cerebral abscesses to one cerebellar. When there is rupture into the ventricle or the meninges there is frequently high temperature, and that is apt to be misleading.

He was a little surprised at what one of the gentlemen had said about the cerebro-spinal fluid. In his own experience it was almost always under pressure in these cases. Brain abscesses of otitic origin are not so frequent as they used to be, for the otitic condition is more frequently cleared up in time to prevent them.

As to the operative procedure: if one is doing simply an exploratory operation, the classical sub-temporal decompression—first suggested to the speaker by Dr. Ballence of London—seemed the best, followed later by operation of the abscess through the decompressed area—the two-stage operation. Dr. McCoy had obliterated the subdural space by injecting paraffin into the subdural space, waiting twenty-four hours, and then going

into the brain. This causes an amalgamation of the membranes which cuts off the subdural or arachnoid space and goes far to prevent infection. It is an experiment that seems well worth trying, as one can obliterate the space better in that way.

Another point to which he wished to refer was the use of suction in emptying a brain abscess. That was not a new thing. Dr. Cushing used it in some of his cases. It cleared up the condition and kept the brain clean.

As to statistics and operative routes, Dr. Dench said that he had 25 cases of brain abscess, 20 cerebral and 5 cerebellar. Of the 20 cerebral cases, 9 were cured, the others died; of the cerebellar cases, 4 died and 1 was cured. In most of his cases—with one or two exceptions—the operation was performed along the avenue of infection, through the so-called stalk. That was his good luck. One case got well which was explored in the old classical position, $1\frac{1}{4}$ inches above and $1\frac{1}{4}$ inches behind the meatus. He had collated a certain number of statistics from literature in going over certain symptoms of brain abscess.

Of cerebral abscesses he had collated 100 cases from various sources in literature; of these 52 were cured and 48 died; this was just a little better showing than his own. In these cerebral abscesses it was interesting to note the type of operation. In 41 cases the abscess was operated through the tegmen tympani, through the avenue of infection; 27 were cured and 14 died. In 37 cases the abscess was evacuated through the squama, and of these 18 were cured and 19 died.*

DR. DOUGHERTY emphasized the difficulty of the diagnosis of brain abscess even in the presence of symptoms such as described by the essayists. He then cited a case on which he had operated; the patient was brought into the hospital and operated for acute mastoiditis; several days later the house surgeon called attention to the fact that the patient was very irritable and would occasionally fall into a restless slumber, and give utterance to a peculiar cry. This was not an unfamiliar cry, and used to be known in the days of his general practice as the cephalic cry of the basilo-meningitic child. The neurologist of the hospital was asked to see the case, and said it was a case of post-operative hysteria, and that further operative procedure was not warranted. The eye men said there were not pressure symptoms, and the neurologists said a second time that there was no indication for cerebral operation, the condition being nothing but post-operative hysteria. Dr. Sharpe was invited to look at the case, and he also said there was no warrant for a brain operation and was inclined to think it was nothing but hysteria.

However, as the patient got no better it seemed imperative to do something, so the brain was opened and a tempero-sphenoidal abscess filled with colon bacillus pus found.

In another case seen in private practice the symptoms seemed to indicate brain abscess. The patient had been operated upon after a fashion by a general surgeon in the country, and came into Dr. Dougherty's care later. This patient had all the earmarks of intracranial pressure. A neurologist, Dr. Sharpe, and his assistant, and an otologist, who was called in consultation, all thought a cerebral lesion was present; they said the eye grounds were hazy, and choked disc indicated. Dr. Kearny

*This does not bear out the assertions made by Dr. Eagleton and Dr. Sharp because here the results were a little better when the abscess was opened through the infected area. In these cases, however, undoubtedly the operator was able to trace the avenue of infection, and this accounts for the seemingly better results by this method. In cases where the path of infection cannot be definitely determined, and the operation is purely an exploratory one, it is naturally much better to explore the brain through a clean subtemporal decompression wound. In the author's opinion where time permits, this operation should be a two-stage operation, the subtemporal decompression being done first. Twenty-four hours after this operation the subdural space will have become obliterated, and the brain may then be explored with little danger of infection from the pus of the abscess.

was requested to examine her eyes and finding she used glasses, gave her the proper refractive correction, and the ophthalmoscope showed that she had clear eye grounds. The condition was very baffling, and nothing definite determined, but the patient was running a temperature that simulated a sinus thrombosis temperature, so the jugular was tied and the "brain abscess" cured.

Dr. Dougherty then asked Dr. Eagleton whether he had any statistics as to the recurrence of an inflammatory process on the site of the original infection. Two such cases had come under his own observation. One was a case of cerebellar abscess reported by him some years ago before the Academy, she had recovered from her primary operation, and four years later—having in the meantime married and given birth to two children—was seized with vertigo and became unconscious. She was sent into the hospital, the brain was entered, without an anesthetic, at the site of the old operation and an encapsulated abscess found. This was curetted, and the patient apparently recovered; some hours later, however, she suddenly sighed and died.

In the other case the patient had had a temporo-sphenoidal abscess following a mastoid, and was operated upon, followed by recovery. A year or so afterward he consulted a general surgeon, who called in the speaker. A subtemporal decompression was done, and the symptoms cleared up, but three months afterward the man fell dead in the street. post mortem diagnosis was rupture of a temporo-sphenoidal abscess into the lateral ventricle. In both instances, there was evidently a recurrence on the site of the primary lesion.

DR. BLACKWELL said that under the head of differential diagnosis there was one other cerebral condition which was sometimes mistaken for brain abscess, *viz.*, apoplexy. He had personally seen one such case operated upon for brain abscess and no abscess found, subsequently autopsy revealed the condition to be apoplexy. A valuable point in the diagnosis between apoplexy and brain abscess is that the pulse of the apopleptic usually becomes more rapid on movement or change of position, the slow pulse of a brain abscess patient is unaffected by similar movements. He found that one of the most characteristic symptoms of otitic brain abscess of the temporo-sphenoidal lobe to be the severe intermittent paroxysmal pain, which comes on suddenly, and is quite unlike any other headache. Judging from the remarks of some of the speakers the operation for otitic brain abscess is frequently considered by them more as a justifiable exploratory procedure. He does not regard this as a proper attitude; certainly, even under the most favorable circumstances, the operation is not entirely unattended by danger. The diagnosis of brain abscess should not present any particular difficulty. He believes that generally speaking, unless the symptoms are sufficiently marked to enable the surgeon to make a positive diagnosis, a purely exploratory operation for brain abscess is not indicated. There are a number of diseased conditions which sometimes give rise to symptoms simulating brain abscess, which may be purely transitory. The cases of temporo-sphenoidal abscesses upon which he has operated have always presented characteristic symptoms; furthermore, there was no difficulty in finding the pus. Dr. Sharpe has stated that the ear men are frequently prone to operate upon these cases through the dirty infected mastoid wound and gave the impression that this was customary with them. This statement is not altogether correct; the rule is to approach abscesses of this region by means of a new wound, through the external surface of the cortex of the temporo-sphenoidal lobe, the abscess being drained by means of a brain knife inserted through the clean dura about an inch above the mastoid wound and passed downward, forward and inward for about an inch and a half; the knife is then slightly turned, which permits the pus to escape; if not found at the first puncture it is usually located at the second or third. Otitic temporo-sphenoidal abscesses are most usually found in that portion of the lobe, which lies just above the tympanum

or mastoid antrum: it follows that the distance between the usual site of the abscess and the portion of the cortex which the speaker has just described for the introduction of the brain knife is much less and more direct than to that region of the cortex lying underneath the temple muscle advocated by Dr. Sharpe for exploratory puncture. He had never been able to drain a brain abscess through an exploratory needle, and had never seen it used where pus has escaped. It was his impression that the pus was too thick; he had seen other men try to so use the needle but without success. Dr. Sharpe has stated that the sub-temporal operation under these circumstances is not accompanied by any harm to the patient. Dr. Blackwell said that in his opinion it was liable to be attended with considerable harm. Dr. Dougherty had just reported a case where a patient so treated apparently recovered (the pressure being relieved) and three months later dropped dead in the street, and at autopsy a large temporo-sphenoidal abscess was found. He himself had seen a patient operated upon in this way and no abscess found; the pressure being relieved, the patient was apparently better; the abscess then developed tremendous proportions and when finally drained the prognosis was worse than if it had been found primarily. For that reason, he considered that often the relief which these patients experience upon whom a decompression operation has been done gives a false sense of security, which is confusing to the surgeon, and apt to lead to fatal results.

DR. GOTTLIEB asked how large an incision Dr. Eagleton usually made in the dura to establish drainage for an abscess; also how widely the brain was opened after the abscess was located, and how the crack originally made in the exploratory incision was kept open.

He disagreed with the last speaker (Dr. Blackwell) in regard to rarity of an abscess being evacuated by a puncture needle. That depended upon the time at which the abscess was entered. If entered early, the pus was composed of sero-sanguinous material. He had entered the temporo-sphenoidal lobe with a needle on the first puncture; the pressure within the abscess was so strong that the plunger was forced out of the syringe before any effort was made to lift it.

He then inquired whether Dr. Eagleton had had any patients die within six or seven hours after a brain abscess had been evacuated and proper drainage instituted.

Dr. Dench had evidently misunderstood what had been said in regard to mastoid operations and brain abscess. He had simply stated that post-mortem experiences record a large number of abscesses where the patients had previously had a radical operation on the mastoid. He did not say he thought they caused the brain abscess, but there was no doubt that many of such patients have had a radical mastoid operation. It was his own belief that entirely too many radical mastoid operations are performed without a proper thorough neurological examination—simply because a man has a running ear and becomes dizzy; at the time the radical operation is performed he may have quite an abscess that has existed for some time. He did not believe that the radical mastoid operation causes cerebral abscess.

In 1913, before the Section on Otology, he had reported that he was evacuating brain abscess with a suction apparatus, long before the first gun was fired in the war. One of the men discussing the matter declared that the suction would pull the brain tissue right out; but it was an ideal method for evacuating an encapsulated intra-cerebral abscess.

He had no statistics to present, but today his percentage of mortality is very much less than it was four or five years ago.

There are at least five different propositions in the evacuation of brain abscess proper. These cases should be divided into five different groups, every one of which requires a different technique, for its most successful treatment.

In regard to apoplexy: he had operated for apoplexy, and had explored for it. One man so treated recovered and lived a long time. There did not seem to be any good reason why a case of apoplexy should not be explored. In one case the patient was a woman supposed to have a brain abscess, and had been paralyzed for seven weeks; he explored and found it was a case of apoplexy, and that woman is alive today. If properly conducted such an exploration would not be attended with great danger.

One should not explore through a dirty area.

As to a positive diagnosis: Of course positive diagnoses are not uncommon in brain abscesses, but in the majority of cases if one waits for a positive diagnosis—especially a cerebellar abscess—the patients are in a deep coma and are not liable to get well. The early cases are the ones that give ample time to prepare a proper technique and should give a higher percentage of recovery than we now have.

As to patients dying on the table: Dr. Eagleton said he had had two such cases.

DR. CASAMAJOR said he was interested in Dr. Dench's remarks concerning statistics, for one can find all sorts of figures in the literature. Where the statistics are based on clinical observations alone they show a preponderance of cerebellar abscesses, for the cerebellar abscess is the most easy to diagnose. When the statistics are gathered from the post-mortem examination it is seen that the temporo-sphenoidal lobe abscesses occur about three to four times as frequently as those of the cerebellum. From a practical point of view when it is known that a brain abscess exists one should then assume that it is supra-tentorial unless definite signs of cerebellar lesion exist. If it is supra-tentorial the chances are in favor of it being in the temporal lobe and one must now proceed to look for minor signs which would point to the location either here or elsewhere in the cerebrum.

He had little experience with brain abscesses of otitic origin, for most of the cases he has seen recently were those of abscess secondary to gunshot wound. Here the diagnosis could be made early, for the localization had already been done by the Boches. With gradually increasing signs, especially if they pointed to a localization corresponding to the original wound, one recommended operation early, usually with good result. He did not find that the blood count or the differential was of any value whatsoever in the diagnosis, as almost anything or nothing might be found. He did not feel he was able to answer the question as to the exact death rate but he knew that he saw more cases on the autopsy table than in consultation.

The question as to the causation of the usual subnormal temperature was a difficult one to answer. Fever in abscess cases is due mostly to absorption of the toxic products, and the brain is the poorest of all absorbing tissues. Brain tumors frequently give lowered temperature and hemorrhage, on the other hand, may give decided increase in temperature where no septic or infectious process is present. So little is known of the brain control of temperature that one can hardly prognosticate what will happen to the temperature in brain lesions, and until we know something definite of this mechanism the cause of subnormal temperature in brain abscess will remain unknown.

DR. SHARPE said that we are all agreed that the mortality from brain abscess is very high, that is, the true brain abscess of the cortical or subcortical type. Merely an opening of the dura and then the escape of pus—does not indicate a brain abscess. The statistics of many men appear very much better for the reason that they consider such subdural and supracortical purulent conditions as being brain abscess formations, whereas in reality many of them are undoubtedly localized subdural abscesses and in no way to be compared with the danger of a true brain abscess. Doctor Sharpe had had forty-one cases of brain abscess; most of these were the complications of infected fractures of the skull and of these only twelve had lived. Of the ten cases of true abscess of the brain

due to otitic disease, only two had lived. The rational treatment has usually been so long delayed by the difficulty of accurate diagnosis that the abscess formation was usually very large—in some patients filling almost the entire cerebral hemisphere, and it is not conceivable for a cure to be obtained in that type of case, excepting in very rare instances.

As regards the subtemporal decompression operation or the cerebral exploration through a "clean" area in order to locate a brain abscess: merely to make the dural incision or puncture one inch above or beyond the infected mastoid arear but through the same operative incision—this is practically the same as operating through the infected area itself and the dural opening naturally becomes infected very frequently with a resulting meningitis—and the death of the patient. In order to explore through a "clean" area, the dural exploratory puncture must be made through another incision—well protected from the primary incision of the mastoid or the infected fracture of the skull.

The risk of the operation of decompression is very slight. Doctor Sharpe had performed the operation of subtemporal decompression and drainage upon 461 children under 6 years of age having had an intracranial hemorrhage at the time of birth and only forty-nine of these patients had died—that is, only 10 or 11 per cent of the entire series, and many of the children were only several days of age; some of these patients were operated upon the second or third day after birth and a large percentage of them were in very poor condition. The operation of subtemporal decompression in itself is not a serious one, outside of the fact that all operations necessitating an anesthetic are serious, but the condition for which the operation of cranial decompression is performed is usually a most serious one. Doctors Dougherty and Blackwell have mentioned the case of a patient in a local hospital having a brain abscess upon whom a subtemporal decompression and exploration was performed and the abscess was unfortunately not located; the patient, however, made apparently an excellent recovery, was discharged from the hospital and, four months later, while walking upon the street and apparently in good health, he suddenly became unconscious and died within several minutes; according to them this case is an argument against the use of the operation of cranial decompression. The mere fact that a patient, having the condition of brain abscess and unsuccessfully explored through a subtemporal decompression, leaves the hospital much improved and then, four months later, this patient dies on the street suddenly—this is no argument against the operation itself, but is another illustration of an imperfect and faulty exploration in the hands of a poorly trained operator; merely because the abscess was not located, surely does not imply that the abscess was not present at the time of the operation, and it is possible that in more expert and skilled hands, the location of the abscess could have been ascertained. The marked improvement of this patient following the mere relief of the increased intracranial pressure by means of the subtemporal decompression, is gratifying and should not be discounted because "it gave us a sense of false security"; surely, if no decompression had been performed, it cannot then be implied that the patient would have permanently or even temporarily recovered without an operation—and at least, the patient was able to lead a normal, comfortable life for four months! There are all kinds of subtemporal decompressions and explorations, but the operation itself must not be discredited by the poor work of untrained operators; to treat the condition of brain abscess competently, a training in neurological surgery and particularly in the surgery of the brain is rather essential.

In conclusion, there is a much better opportunity of locating a brain abscess through a large area such as the subtemporal decompression than there is through the small area of dura exposed in the mastoid operation, and the danger of a resulting meningitis, and thus the death of the patient, is much less through the "clean" subtemporal area than it is through the "dirty" infected field of the mastoid and through the same scalp incision.

The New York Academy of Medicine.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

January 28, 1920.

Chronic Frontal and Ethmoidal Sinusitis. External Operation. Presented by DR. C. G. COAKLEY.

Patient, Ruby Rawlins, colored; bor in British West Indies, 24 years of age; occupation: sewing.

Previous Admissions to Bellevue: 1. September, 1918—Right frontal sinusitis—discharged February, 1919. 2. May, 1919—Maxillary sinusitis—discharged June, 1919. Last admission: 3. October, 1919—Frontal and maxillary sinusitis and ethmoiditis.

Complaint: Nasal discharge, right side. Headaches. F. H.: Irrelevant P. H.: General health in past has always been good. None of the usual childhood exanthemata. Malaria at 12 years. No previous operations. Frequent frontal headaches and much nasal discharge for past five years. The discharge has been limited to the right side and is described as thick and yellow. No ear complications. No history of "colds." G. U. history is negative. P. I.: Onset three and a half years ago with pain over the right eye and discharge from the right side of the nose. At this time a specialist was consulted and a right inferior turbinectomy was done. (1) Right inferior turbinectomy three and a half years ago. This did not seem to improve local condition. The discharge and headaches continued. (2) In January, 1917, an internal opening into the right frontal sinus was made. Manhattan Eye and Ear. The discharge increased greatly and the pain was somewhat relieved. Patient noticed at this time much crust formation in the right side of the nose. (3) In September, 1918, the ethmoid cells were curetted and irrigation of the right frontal was begun. Bellevue Hospital. This discharge discontinued only to begin again after a few months. (4) In May, 1919, a right radical antrum operation was done. Bellevue Hospital. Since June, 1919, patient has been under observation at the Bellevue Clinic. The discharge continues and the patient still complains of frontal headaches.

Physical Examination: Patient is a rather obese colored woman. Heart: Mitral insufficiency which is well compensated.

Nares: Nose is straight—flat—flaring alae. Septum fairly straight. Right middle turbinate removed. Anterior ethmoids have also been removed. Right frontal can be probed—pus appears to be coming down from frontal region. Small opening into right antrum under inferior turbinate.

Accessory Sinus and Transillumination: Right antrum and frontal deficient on illumination.

Oro-Pharynx: Tongue clean. Teeth fair. Tonsils medium size and cryptic. Pillars, palate and pharynx negative.

Naso and Laryngo-Pharynx: Some secretion in epi-pharynx.

Larynx: Negative.

Right Ear: Negative.

Left Ear: Negative.

Diagnosis: Right frontal sinusitis. Right ethmoid sinusitis. Right maxillary sinusitis.

X-Ray Report: October 9, 1919—Right frontal sinusitis. Right ethmoid sinusitis. Right maxillary sinusitis.

Laboratory Report: October 7, 1919—October 19, 1919—Urinalysis negative.

October 19, 1919—*Blood:*

Leucocytes	6,000
Polynuclears	65%
Transitionals	2%
Lymphocytes	30%
Large mononuclears	2%
Eosinophiles	1%
Total	100%
Hemoglobin	90%

Temperature: Has been normal for the most part, with occasional evening rises to 100°.

Operation: October 23, 1919, by Dr. C. G. Coakley. Assistants: Drs. Pratt and Carr. Anesthesia: Chloroform. Anesthetist: Dr. Bennett.

Description of Operation.

Pathology: The right frontal was rather small, measuring about 1 inch in height by 2 inches broad and $\frac{1}{4}$ inch deep. There was an orbital recess running out externally beneath the orbit nearly 1 inch beyond the external limit of the frontal sinus. The mucous membrane lining the frontal was very much thickened and there was a small amount of yellowish pus present. The ethmoid labyrinth contained thickened polypoid mucous membrane and a moderate amount of yellowish pus.

Procedure: Two incisions were made. The first incision began in midline about $\frac{1}{4}$ inch above the right eyebrow and extended externally to a point opposite the external canthus of the right eye. The periosteum was elevated and the anterior wall of the frontal sinus was entirely removed by means of gouge and rongeurs. The orbital arch measuring about $\frac{1}{2}$ inch in width was preserved. All the mucous membrane lining the frontal and extending out into the orbital recess was thoroughly curetted. A small perforation was accidentally made in the upper portion of the inter frontal septum. The second incision began at a point just external to the supra orbital notch in the floor of the frontal sinus and extended in a curved manner midway between the inner canthus of the eye and the dorsum of the nose descending along the side of the nose to the lower portion of the right nasal bone. The periosteum was reflected and a portion of the nasal and lachrymal bone was removed by chisel and rongeurs giving access to the ethmoid labyrinth. All the anterior and posterior ethmoid cells were thoroughly exenterated and the anterior wall of the sphenoid removed.

Closure: The frontal wound was closed by means of a subcuticular dermal suture. The ethmoid incision was closed by four interrupted horse-hair sutures.

Drains: A cigaret drain was brought down from the right frontal through the vestibule of the nose and a $\frac{1}{2}$ inch iodoform gauze drain was placed in the right ethmoid region.

Cultures: Culture was taken of the pus and some of the thickened polypoid membrane was retained for pathological examination.

Pathological Report: October 24, 1919—Chronic inflammation.

DISCUSSION.

Dr. T. J. HARRIS expressed his interest in seeing the case and hearing Dr. Coakley's exposition of the operative procedure, and regretted that he had not known of this incision before. It was certainly one that all should consider, though he himself had been satisfied with the incision through the eyebrow and did not recall any of his cases that had resulted in the deformity to which Dr. Coakley had referred. The double incision of which Dr. Coakley had spoken was especially valuable; everything was in its favor and there was nothing against it. The point made by Dr. Coakley in reference to the value of the operation not merely in regard to the frontal sinus but because of the large orbital recess was especially important and explained the long and large incision made. This incision

had the advantage of avoiding the upward incision. Another important point was that in spite of wounding the inter-frontal septum there was no infection on the opposite side.

There was a very well defined group of cases where nothing except the frontal sinus operation would avail to cure the condition. Dr. Harris said he was not any more enthusiastic than he was years ago in regard to intra-nasal procedures on the frontal sinus. For the rank and file of men it was not a safe procedure and it was much better to undertake the operation offered by the external route.

Dentigerous Cyst of Maxillary Sinus. DR. E. L. PRATT.

In January, 1919, while serving with the U. S. Army in France, the patient began to be troubled with nasal obstruction on the left side. He was examined by a medical officer who pronounced the condition a simple cold in the head. About a month later, the patient noticed an increase in the nasal obstruction and also noticed, for the first time, that the left side of his face appeared somewhat swollen, but there was no discomfort other than that caused by the nasal obstruction. He was discharged from the army in May, 1919, at which time he observed impairment of nasal respiration on the right side of the nose. The swelling over the left cheek gradually became larger, and both nares became more and more obstructed. In October, 1919, he came to the Vanderbilt clinic and was referred to Dr. Coakley's service at Bellevue Hospital, for operation.

The physical examination showed the left side of the face from the malar prominence to the level of the upper teeth to be considerably swollen, but not discolored or tender. The ginfo-buccal fold was bulged outward. That portion of the hard palate to the left of the median raphe was bulged downward (as shown by case presented, made at the time of his admission).

Examination of the nares showed a hard mass bulging up the floor and also coming out from beneath the left inferior turbinate, running back nearly to the choanae and almost completely filling the inferior meatus. The right side showed a similar condition, except that there was only slight bulging of the floor. Transillumination of the sinus showed a very dark left antrum and only slight darkness of the right antrum. Both nares contained a moderate amount of thick mucoid secretion, but no pus. Pressure over the left antrum, made by passing the finger under the cheek into the canine fossa elicited the sensation one has in making pressure over thin ice—a huddling sensation. This same sensation was present on pressure over the posterior portion of the hard palate. The so-called "egg-shell crackle" was not present. There was no evidence of infiltration of the hard palate or of the superior maxilla. The upper teeth were all present and were apparently healthy.

From the physical examination, and the examination of the X-ray plates that were made, the diagnosis was made of cyst of the antrum (left) extending below the floor of the nose into the right antrum.

DISCUSSION.

DR. A. J. HUEY said he was especially interested in Dr. Pratt's case because of a similar one he had seen a month ago, on which he hoped to report later. The patient presented himself at the clinic with the history of having had several teeth removed a few weeks previously. The removal left a sinus which discharged pus. The antrum was washed out in the usual way, and examination revealed an opening extending clear through to the nose; a probe went into the sinus for an inch and a half, and when fluid was injected it went into the nose. Dr. Lewald X-rayed the case and found a sacculated mass extending into the antrum, and connected with the sinus which ran down to the region of the teeth. This was removed and an opening was found in the anterior wall of the antrum, the size of a dime. The mass of tissue was filled with foul-smelling pus, etc., and extended well into the antrum. Dr. Lewald would show the pictures of the case.

DR. LEWALD exhibited the X-ray plates showing the very circumscribed mass distinct from the antrum and projecting into it. It was more sharply outlined than in the case presented by Dr. Pratt, for it hung within the antrum like a cyst. The history of the clear return from the antrum and the discharge through the floor of the alveolar process immediately suggested a dentigerous cyst as the most likely diagnosis, and it seemed to work out as the most likely explanation of the lesion.

Dr. Lewald said he would like to know if Dr. Pratt had any theory as to the exact origin of the condition. The teeth were all present in his case and in this one all the teeth were absent. Whether a tooth had not developed and had produced the cyst could not be determined. It would be interesting to know more of the history. In the anterior position one could distinctly see the circumscribed mass projecting up three-quarters the distance of the height of the antral wall, outlining and occupying three-fourths of the width of the antrum. Such lesions are very rare, but possibly are not always diagnosed before they have broken down into the antrum and are then considered to be antral disease.

DR. COAKLEY said that these two cases presented phases that are seen clinically—one of them a phase which could not be clinically illustrated tonight. The dentigerous cyst probably arises from some misplaced cells of the teeth and the commonest variety is found in the alveolar process, which is small in size, round or oval in shape and does not invade the antrum at all. It can be opened and treated as a gumball, for it frequently acts as such; when incised it discharges and fills up again, and it may continue that procedure for months or even for years. It is not really cured until the necrotic area is found and the interlining membrane of the cyst thoroughly cleaned out. It does not invade the antrum. Another variety is that in which the cyst develops from somewhat higher up or grows into the antrum—but does not entirely fill it, as in the case reported by Dr. Huey—and there is no bulging of the antral wall as in the case presented by Dr. Pratt. That was a slow-growing process and it might be there years before it completely filled the antrum.

Dr. Coakley said he had seen only three cases like Dr. Pratt's. In one case a boy had had the condition for years; he had a cold and an infection, and it was a very puzzling condition, for when these cysts are filled up they transilluminate more brilliantly on the affected side than on the other owing to the spherical action of the cyst condensing the light. That is quite typical of even infected cyst. There was no odor, no discharge; most of these cases that become infected have a discharge and that causes them to break through the antral wall. Dr. Pratt's case was one of the suppurative kind that did not break through; there was no sign of suppuration anywhere. Probably what happened was that while the patient was abroad in the service he had an acute condition and got an infection and it increased rapidly in size.

There are three types: one that occurs and does not invade the antrum; one that is in the antrum and grows slowly, and the third is the infected type that grows rapidly.

In the large cases where there is considerable thinning of the anterior wall and considerable loss of tissues there seems to be no way of avoiding a large hole, resulting in a permanent opening. There is no plastic operation that will close such an opening, and the only way of managing it is to use a good obturator; the patient can easily learn to keep it clean.

DR. THEODOR BLUM (*by invitation*) said that he came to the meeting tonight because he was especially interested in the question of cysts of the jaws. He was rather surprised to find on the program the title "dentigerous cyst," and certainly that name did not apply to the cases presented, for no connection had been shown to exist between a dental cyst and this particular cyst. So far as he had heard, no microscopic examination had revealed a mucous lining. These growths are divided in three types: one caused by an infected tooth or tooth root, and therefore termed

a radicular cyst; the second type is the follicular cyst which originates from the follicular part of the tooth; the third the so-called multilocular cyst, which is never found in the maxilla, but only in the mandible. As to the lining of these cysts, it must be remembered that they have an epithelial lining.

The radicular cyst, which is the most common, has its origin in a diseased tooth, and so far as is known at the present time it starts from a so-called chronic apical thickening of the peridental membrane. Through the growth of this part of the peridental membrane the blood supply is cut short and therefore the center of this thickened area breaks down and is finally lined by epithelial cells—and only then can we properly call this growth a cyst.

A thorough study of cysts during the last year, not only of the membrane but also by aspiration, showed that the cyst contents are nearly always sterile unless they have been secondarily infected by interference of some kind; for instance, by an incision made by a dentist or surgeon believing they are treating an abscess. On the other hand, dentists may consider them as abscesses and extract a tooth, and a secondary infection may take place that way.

Dr. Blum said that in an experience of 200 or more cyst cases, he had never seen such a cyst break into the antrum—but there were cases reported where a cyst had been secondarily infected and had broken through that part of the cyst which showed least resistance, the part nearest the antrum. Through the growth of a cyst the antrum might be displaced or even obliterated, as shown in the case presented by Dr. Pratt.

There are two operations for these cysts: one, the so-called radical operation, as performed in Dr. Pratt's case; the other, the conservative operation, which was originated by Partsch of Breslau, which consists in removing the outer cyst half and leaving the inner half intact, allowing the cavity to become shallow and in time to obliterate entirely. The objection that these cysts recur is unfounded, for Partsch reported 200 cases operated upon in this conservative manner when microscopic examination had shown later on that the mucous lining had assumed the microscopic make-up of the mucous membrane of the mouth. The operation performed in this particular case must affect the teeth above which the incision was made, and they will have to be opened up by a dentist and the canals treated if they are to be saved. Therefore the teeth which are involved by the incision made above the apices must be devitalized.

Dr. Blum said he had been very much interested in this case for he had seen a model of it in the clinic at Bellevue Hospital with which he is connected.

Dr. Hurd said that a couple of years ago a man came to the office with pansinusitis, and on washing out the antra there was a return flow of golden yellow fluid with crystals. There was no pus in the antrum at all; in contradistinction to Dr. Blum's account, the needle was accidentally put into the cyst. The patient is still going about with the cyst, a man 55 years of age.

Dr. Blum spoke about devitalizing the teeth. That might be true, but Dr. Hurd had never seen any harm come from that. He had observed such cases for years, and yet they seemed as good as ever.

Dr. McCULLAGH said he would like to speak a word about dermoid cysts. He was reminded of a case of cyst of the antrum of that type upon which he had operated. It was infected and a sinus led from it through a tooth socket. The operation was through the canine fossa. In curetting what was thought to be the antral cavity, the bony anterior wall seemed to move. Investigation showed a bone-walled cyst that formed a cast of the antrum. The entire cyst was removed intact except for the opening made operatively, revealing a normal antrum. Dr. Jonathan Wright reported that it was a dermoid cyst. The specimen was kept at the Manhattan Eye, Ear and Throat Hospital for a good many years.

Dr. PRATT said that Magitot claims that all cysts of the maxillary sinus are dental in origin, and gives a very comprehensive review of all the

literature from the seventeenth to the middle of the nineteenth century. Others claim that there are simple cysts of the antrum due to obstruction and dilatation of the mucous glands of the antral mucous membrane, or else caused by cystic degeneration of the sinus mucous membrane, the mucous glands being transformed into thin walled cysts. Cysts of this type does not cause bulging or thinning of the antral walls. The condition called hydrops antri is generally denied, the so-called cases being either cystic polyps, subperiosteal abscesses, or dentigerous cysts.

DR. COAKLEY said that the two cysts were quite different in origin; one was probably a cyst of the mucous membrane. The one mentioned by Dr. Pratt had bone between the walls that could have developed only after a long-standing process, which was the reason he felt it had been there a long time before it became infected. It was very much like the hydrops antra one hears about, a thin-walled cyst with a watery secretion, not the gelatinous secretion which is in the typical cyst.

DR. PRATT said the differential point was in the character of the secretion—one had a watery and the other a gelatinous secretion.

DR. BLUM, in reply to an inquiry from Dr. Coakley, said that that was his experience also. The contents of a mucous cyst were very much like those found in the ranula, a mucous, stringy, gelatinous material.

A Case of Anerobic Bacillus Infection of the Mouth. Presented at The Academy of Medicine, New York City, January 28, 1920. From the Service of Dr. C. G. COAKLEY at Bellevue Hospital by Dr. J. W. BABCOCK.

This case shows a somewhat unexpected recovery by an old man from a severe, ulcerative stomatitis and gingivitis due to or at least associated with an anerobic bacillus, probably that associated with a spirillum in Vincents' Angina and complicated by chronic parenchymatous nephritis. At one time actual necrosis through the cheek or noma was feared; but now he shows only scars and some bad teeth which he refuses to have extracted, rendering him liable to another attack, I fear.

Case Report: Antonio, L., Italian; bootblack, 62 years, of 1752 Amsterdam avenue, admitted to Dr. Coakley's service at Bellevue Hospital, November 20, 1919, with sore mouth as his chief complaint. Family history irrelevant. Past history negative, except that two years ago he was operated upon at Bellevue Hospital for diabetic cellulitis of his right foot, which has remained healed. Present illness: Ten days ago teeth and gums became painful and have grown worse until now deglutition and speech are very painful. No treatment.

Physical Examination: Emphysema, pupils small, equal, irregular in outline and react sluggishly to light. Romberg was positive on admission but that seems to have been due to weakness as it is now negative. B.P. 130/70. Temperature, pulse and respiration normal.

Mouth shows several teeth missing, two loose in their sockets, no lead line ulceration along gum margins, extensive ulceration with necrotic tissue at the base in each cheek opposite upper molar teeth, and a small patch of exudate on the hard palate. Breath is very foul and can hardly open his mouth, the ulcerated area is very tender and induration can be felt through the skin of each cheek. No lymphadenitis.

Wassermann negative, W. B. C. 12,400, polys. 75%, lymph. 21%, L. monos. 4%, hgb. 65%; urine: straw 1015; acid, albumen 2%; glucose negative; numerous granular and hyaline casts and epithelial and pus cells.

Smear from ulcer of November 22. Numerous cocci and diphtheroid bacilli, no Vincents organisms. Culture of December 2. Staphylococcus albus and numerous diphtheroid bacilli.

Sections from margin of ulcer show chronic inflammation, granulation tissue and dead tissue. (Dr. McWhorter.)

Anerobic culture shows a bacillus giving the same foetor as breath at the height of the ulceration, but no spirilli were obtained. Dr. Zinsser thinks it the same anerobic fusiform bacillus associated with a spirillum

in so-called Vincents' Angina and mentions as one of its characteristics its extreme susceptibility to tincture of iodine.

On December 9, Dr. McKinney, resident dentist at Bellevue, reports finding and removing a gauze drain about 6 inches long from the right cheek. Some doubt has been felt as to this finding as large pieces of slough had previously been removed, no drain had ever been noted previously and patient denies that any was ever inserted, and no cavity could be found that could contain such a piece of packing.

The patient has been treated by removing such slough as could be removed without causing bleeding, cleansing the mouth and applying 7% tincture of iodine to the base of the ulcers every other day and sodium bicarbonate mouth irrigations and 2% potassium chlorate mouth wash twice a day. After the slough had separated 10% silver nitrate was applied to the granulations. By December 31, fifty-one days since onset and forty-one days after treatment was commenced, mouth has entirely healed but scar tissues somewhat limits opening of mouth. He has refused permission to extract several teeth which was advised, but later permitted extraction of one which had an abscess at its root.

Two weeks ago he developed parotitis apparently due to cicatricial stenosis of Stenson's duct, which largely subsided but which I note tonight has recurred.

DISCUSSION.

Dr. COAKLEY said that such cases are of great importance, and probably more of them are seen at Bellevue than elsewhere. About ten or twelve cases are seen there in the course of the year and most of the patients die—probably on account of the fact that it is almost impossible to get anyone to take care of them properly. They require a great deal of attention, and most of them apply so late that little can be done for them. It requires a man with a good strong stomach to sit down and clean up the condition, and Dr. Babcock deserved great commendation for what he had been able to accomplish in this case. Probably half of such cases terminate fatally.

Dr. McCULLAGH asked if salvarsan had been tried.

Dr. COAKLEY replied in the affirmative but added that it did not do any good. The increase of stringy fibrous tissue was surprising and it was difficult to remove it so as to get the iodine preparation where it will do the most good. The iodine preparation had given the best results, and that was in line with the bacteriological findings. The great difficulty is to make the application where the bacteria are actually doing the work, not in the outer portion. It requires from half to three-quarters of an hour to properly treat a case and demands a man with a pretty good stomach.

Dr. IMPERATORI told of a similar case under treatment in the hospital. When the case was first seen, it was impossible to examine this patient's mouth because of the severe pain and spasm of the muscles in the cheeks and jaw. It was necessary in order to examine this man, to put him under a general anesthetic.

Both inner buccal surfaces were found to be extensively involved, there being several large necrotic areas.

All diseased teeth were extracted.

Various medicaments were used, but none seemed to be of much use. On looking over some Reports of the American Expeditionary Forces on Mouth Infections, an article was found recommending the use of dilute acid alcohol as an application and a mouth wash. Whether it was the use of this acid alcohol or the previous treatment, the patient began to improve and the odor was considerably lessened.

The proportions of the solution used, were one ounce of alcohol, one of strong white vinegar and four of water.

Dr. HUNN said that last year a patient from White Plains came to the Manhattan Eye, Ear and Throat Hospital, and was later referred to Bellevue. Examination failed to reveal the presence of the Vincents' organism

or any except the usual ones. He had lost all his teeth, and had necrosis of the hard palate, cheek, tongue and soft palate. At one time a strong solution of salicylic acid and alcohol was employed, but without benefit. Finally the patient returned to White Plains, and probably died. He was scrubbed until he begged not to be treated any more.

Dr. LEWALD said that while serving in the Philippines he had seen a number of cases of gangrenous stomatitis which he thought to be due to the ameba buccalis. In view of the present knowledge of the effect of emetine, that treatment should be tried on some of these cases. Unless the search is made of a fresh specimen on a warm stage one would not suspect the possibility on amebic invasion.

Dr. BABCOCK said that smears had shown no ameba; but it was not on a warm stage, but he had not thought they would become inactive in the short time taken in examination.

Replying to Dr. Hurd's remarks, he said it was not well to scrub these cases too much; one should remove all the slough that will come off easily, but should not go down to the bleeding tissue, for that would cause a fresh area of necrosis.

He had not intended to make any special claims for iodine; but they had found it very satisfactory and had tried no other remedies on this case.

Unique Foreign Body in Nose. Successful Removal. Presented by Dr. IRVING WILSON VOORHEES.

N. A. W., male, colored, age 34, native of British West Indies, came to the West Side Dispensary January 17, 1920, with a history of yellow discharge from the right nostril during the previous two months.

Examination showed a large black mass in the right nasal fossa, very firm and hard but quite freely movable in its bed. The septum was pushed over to the patient's left, and the mass was bathed in yellow pus. It seemed reasonable to suppose that we had to do with a mass of necrotic bone, probably a sequestrum from the naso-antral wall following a tertiary lesion. Pledgets of cotton saturated with 10% cocaine were introduced into the nose and left for ten minutes, at the end of which time our diagnostic acumen received a rude shock.

When 17 years of age, that is, seventeen years ago—he is now 34—the patient tried to invent a gun. He took a piece of "bicycle pipe" about 1 foot long, into the open end of which he screwed a threaded bolt borrowed for the occasion from sort of a bedstead. He then bored a touch-hole in front of this breech plug. Into the muzzle he loaded a charge of gunpowder, rammed it down, followed this with a few "BB" shots, which were also rammed down, and then invited his cousin to apply a flame to the touchhole while the patient held the apparatus after the fashion of aiming a gun. The charge exploded and so did the piece of pipe. The breech plug blew backward and was never seen or found, but small pieces of iron penetrated the left side of the nose in the region of the ethmoid. The scar from these fragments is still quite visible but insignificant. The boy was in bed for seventeen days and was visited twice daily by a physician who did not, however, locate the piece of iron. For seven months thereafter the boy experienced pain in his head and between the eyes about 10 o'clock each morning. Considerable discharge came from his nose. This was worse, he thinks, in summer. He came to the clinic chiefly because his friends chided him about a stench from his head, and because of "frequent colds."

After removing the cocaine pledgets the black mass above mentioned was grasped with a strong nasal grasping forceps, and much to our surprise a solid, heavy object was gradually withdrawn from the nose, occasioning only very slight discomfort in its passage. Upon washing it off under the water tap, the improvised "breech plug" was identified as the missing iron bolt which seventeen years previously had been suddenly projected into the patient's nose.

The dimensions and weight of the bolt are: Length—5½ centimeters (2¼ inch); diameter—1½ centimeter (½ inch); weight—a little over 1 ounce.

There is probably some latent sinus trouble which we intend to look into as soon as the X-ray plates can be made.

It seems hardly possible that any human being could carry such a foreign body in any part of his anatomy for seventeen years and not be conscious of its presence. But there is no denying the fact that it actually did happen.

Two Interesting Tonsil Cases. DR. R. T. ATKINS.

The cases I have to report are tonsil cases in which bone was found.

The first is that of an interne at Bellevue Hospital who had suffered repeated attacks of tonsillitis and peritonsillitis.

The operation was difficult because of the presence of a hard substance posteriorly, which was thought at first to be the styloid process of the temporal bone, but later proved to be a thin shell of bone which encircled the tonsil just outside of the capsule.

Pathological Examination: Gross—The specimen consists of apparently two tonsils. On cross section the anterior surface of the tonsil cuts easily but one meets an obstruction on the posterior surface which cuts through as a thin shell of bone. The second specimen shows practically the same thing with a dense shell-like structure around the tonsil which feels very calcareous or bony. Microscopical—The tonsils show hyperplasia of the lymphoid tissue on both sides with a very striking picture. Partially surrounding the lymphoid tissue and extending into the connective tissue, also around some mucous glands, there is a dense well formed bone with a definite periosteal structure upon its outer surface in places. There are, furthermore, areas within the bone substance where there is definite cartilage. The cartilage cells are large with deeply staining nuclei and quite characteristic in appearance. There are also areas which show deposition of lime salts. The bone is trabeculated in places showing normal fat within the canaliculi. Both tonsils show the same thing.

Diagnosis: Hypertrophy of the tonsils with bone formation. John E. McWhorter.

The second case is one of tuberculous tonsils in which true bone was found.

Pathological Examination: Gross—The specimen consists of tonsils, marked right and left. The specimen marked right measures 3x2x2 cm. In this state it is firm on palpation and grayish in color and apparently nucleated. On cross section there are irregular, yellowish, mottled areas, some of which connect by means of crypts, with the surface of the tonsil and others apparently do not. They strongly suggest areas of caseation necrosis. Sections are taken through these areas. The second specimen marked left tonsil measures 2x2x1.5/10 cm. It is grayish white in color, and on cross section looks quite different. There are no irregular yellowish areas but a few hemorrhagic areas and the crypts apparently do not extend down as deeply into the interior. The cross section of this section presents a soft gray homogenous surface. Microscopical—The right tonsil shows several rather extensive areas of coagulation necrosis. Scattered throughout the lymphoid tissue and particularly beneath the mucous membrane are many small circumscribed areas consisting of coagulation necrosis, epithelioid cells and giant cells. In certain areas the lymphoid tissue has been replaced by rather dense connective tissue. Within the depth of the tonsil there are several small areas which stain red with eosin and have the appearance of true bone. The lymphoid tissue is markedly hyperplastic and the lymph sinuses are infiltrated with round cells. The left tonsil shows a somewhat similar condition to the right with the exception of there being no definite areas of coagulation necrosis. It shows the same apparent bone formation and also under the slide shows small zones of calcification.

Diagnosis: Tuberculosis of the tonsils with bone formation. John E. McWhorter.

DISCUSSION.

DR. COAKLEY said that a number of these cases had been reported but he did not recall the etiology.

Removal of Foreign Body from the Esophagus. DR. E. L. PRATT.

The foreign body consisted of two pieces of chicken bone, one of them being an inch long and very sharp, and the other, a smaller piece, about one-eighth of an inch both ways. The patient was a woman 44 years of age, who came to Bellevue on Thanksgiving Day. Three hours before she had been eating chicken pie and had felt something stick in her throat; she immediately ate a lot of bread, which she had some difficulty in swallowing, and then tried to swallow a lot of mashed potato, but could not. She then went to her family physician and told her story, and complained of a sticking pain in the region of the cricoid cartilage. He advised her to go to a hospital. That was somewhat different from the usual story, where the family physician pokes his finger down the throat to try and feel the foreign body. In a case seen some two years ago the family physician tried to find a fishbone which a patient had swallowed; he said he had made a very thorough examination by pushing his finger down, but could find nothing.

This patient was given an anesthetic and a Mosher tube passed down about 17 cm. from the teeth; a large grayish mass was seen and was removed by suction. It proved to be tough chicken skin together with a crust of bread. In the tough part of the skin was a small piece of chicken bone. When this was removed, a larger piece was seen lying transversely in the esophagus. A pair of alligator forceps were then passed down and the left end of the bone was seized and as the forceps were withdrawn the bone rotated in the grasp of the forceps so that it came up in the tube and the tube was removed with the bone inside.

The right end of bone was very sharp and had that end been seized instead of the duller left end, the esophagus might have been lacerated in attempting to remove the bone.

Two Cases of Foreign Body in the Bronchi. DR. C. J. IMPERATORI.

(Published in THE LARYNGOSCOPE, May, 1920.)

DISCUSSION.

DR. CARTER asked if the Hubbard hook could be run behind the ball, and how it was possible to get hold of a slippery body of this character.

DR. IMPERATORI responded by drawing a diagram and demonstrating the method employed, and then spoke of the variation in the value of X-ray plates.

DR. LYNNAH said that Dr. Imperatori deserved to be congratulated on the successful removal of such difficult foreign bodies from the lung. The branching grape-stem in the bronchus of such a young infant presented great difficulties. It was indeed unfortunate that the infant should succumb after the successful removal of the intruder, but such is frequently the case with many of the irritatin' substances inhaled into the lung of young children. After the inhalation of extremely irritating substances into the lung, these children wheeze and rasp for air and are profoundly prostrated. They seem to be able to inhale air much more easily than they exhale it. This in turn produces an enormous amount of pulmonary emphysema with extreme cyanosis as the result. Dr. Imperatori mentioned that the infant was prostrated and cyanotic at the time he saw it before bronchoscopy, and this was too much for the weak infant to overcome, and death followed from pulmonary ballooning and cardiac exhaustion.

The ball bearing case was unique, and no other similar case had been recorded and the method of extraction and the rotation of the foreign body with the Hubbard hook was very ingenious. Dr. Imperatori demonstrated that the double hook forceps of Bruning's were the only forceps that would hold. Unfortunately many of the Jackson forceps are made too weak to be of much use in separating the bronchial wall in such a

case, and the mechanical procedure adopted by Dr. Imperatori in the successful removal of such a foreign body was an admirable one.

Dr. FORBES congratulated Dr. Imperatori on his success in these trying cases, and also upon his not following any set rule in regard to anesthesia. Dr. Jackson advises the avoidance of general anesthesia as much as possible. It was difficult sometimes to judge of these cases. Whether it will be possible to control the given case, Dr. Imperatori stated that his child looked as though he would be very unruly, and certainly it is much easier to control such cases with general anesthesia.

Dr. Forbes said that as his own experience with local anesthesia grows he finds he does much better work with it; but in a number of cases recently, even when the foreign body was in the esophagus, high up, he had not hesitated to give a general anesthetic—especially in cases where others had already manipulated the case. One child had a penny in the upper part of the esophagus and had already been manipulated by a physician; when first examined it was so lacerated and parts so swollen that nothing could be seen, and the ordinary child's size of the Jackson esophageal speculum proved of no use; the soft parts fell into the open lumen. Finally, with the aid of Jackson Anterior Commissure Laryngoscope, the foreign body was found and removed very easily owing to the tube being closed.

Case of Enlargement of Sella Turcica with Impaired Vision. Presented by Dr. L. M. HUBB.

The patient, A. D., a woman of 21, was admitted to the hospital on December 17, 1919, her chief complaints being headache and nausea.

The family history was irrelevant. The patient had measles at 5 years of age, but no other illness until the present trouble. No headaches until October, 1919; no trouble with ears or nose; no dizziness, no tinnitus. Her menses began at fourteen or fifteen, lasting six days with a rather full flow. No change since present illness.

Her headaches began in October, 1919, being mid-frontal and lasting generally one day, at first once a week; later two or three times a week. For the last three she had had them only with menses. The headaches were unassociated with scotomata. They continued for about one week and later increased in intensity. Besides the headache and nausea, patient feels so weak she cannot sit upright. A typical attack was the last one. Monday night, about 2 a. m., while in bed, she suddenly had a severe frontal headache and nausea. The pain was so severe that she had to be restrained by members of the family. The pain continued until Wednesday. The patient did not lose consciousness, but says she cannot remember anything that happened on Tuesday.

Physical Examination: General Appearance—Pupils are dilated. Fairly well nourished young woman, in no apparent discomfort; answers questions readily. Eyes—Pupils dilated, react to light; extra-ocular movements normal. Exophthalmos present. Heart—Not enlarged; sounds are clear at apex and base. Sinus arrhythmia present. Lungs—Negative. Abdomen—No tenderness or masses. Liver and spleen not palpable. Skin—Clear, of normal texture. Hands—Unusually long, tapering. Lymph Nodes—Few glands in posterior triangle palpable. No general enlargement. Reflexes—Knee-jerks hyper-active; equal. Babinski—Negative. Blood Pressure—110/7 mm. Hg.

Eye Examination: December 17, 1920. Right Eye—Pupil dilated, reacts promptly to light. There is a clonic contraction of pupil (hippus), and marked haziness about the disc; veins dilated and tortuous. Left Eye—Findings about the same as in other eye, except that there is a cluster of small exudates in the macular region and a few very small hemorrhages in the fundus.

Remarks: The hippus of pupils is of no particular diagnostic importance. The picture of the (O. D.) is that of a neuritis (the elevation of the disc being only about 1 mm.; it is impossible to say whether or not there is a choking of the disc). In the right eye the picture is that of a

neuro-retinitis. One would suspect Bright's disease. Diabetes could be responsible; and brain tumors have been known to produce such pictures.

Vision of right eye: 20/20-4. No improvement with lenses.

Vision of left eye: 20/200; with lenses, 20/100.

There is an irregular astigmatism of O. S., which may account chiefly for the high degree of amblyopia. Irregular astigmatism cannot be corrected very much by lenses.

The visual fields taken by Dr. Works are consistent with findings in fundus. (Burgess.)

December 18, 1919. Papillo-edema right and left, with a macular fan on left and beginning atrophy of right. It is important to consider whether the atrophy on left is a pure secondary atrophy or a retrobulbar neuritis superimposed on a papillo-edema. There is a diminution of the right abdominal reflexes and the right plantar reflex is pathological. Dorsi flexion of right foot is weaker than left. No astereognosis.

December 20, 1919. Urine, 24 hours, 200 cc.

December 20, 1919. Phenolsulphonephthalein test for renal function:

1 hour=45%;

2 hours=25%;

total, 80%.

December 22, 1919. Choked disc of both eyes, more marked in the left eye. Right eye elevation disc, 2 D.; left eye elevation disc, 3 D. In left eye, changes at macula. The changes represent a collection of small spots of exudate.

Clinical diagnosis: Pituitary tumor.

X-ray Diagnosis: The sella turcica is large, measuring 21x10 mm. Erosion of the anterior and posterior clinoid processes (this with hiatus) somewhat irregular. The sphenoidal cell is small.

December 24, 1919. Blood sugar 75 mg. per 100.

December 26, 1919. Urine, 24 hours, 900 cc.

January 1, 1920. Eyes no worse.

January 2, 1920. Double papillo-edema more marked on left. Right-sided facial paresis seems to be cerebral in type and at times suggestive of a thalamic defect. Right abdominal wall reflexes are diminished compared to left and much more readily exhausted. Deep reflexes exaggerated in all extremities; right plantar reflex not definitely flexor; probably lesion of hypophysis more marked on left with pressure on crura cerebri. (Dr. Friedman; Dr. Stevenson.)

Eyes: Right pupil 7 L; both react slightly to light. No nystagmus; no ataxia. Left eye proptosed. Venous stasis marked in left eyelid. No supranuclear palsy of face.

Sugar tested for in urine. Fifteen minims (M xv) of pituitary liquid (posterior lobe) administered intra-muscularly at 12:30 p. m.; saved in three specimens at 2, 4 and 6 p. m.; none of the specimens gave a reduction in Fehling's solution.

January 5, 1920. After lumbar puncture by Dr. Sievers, patient had nystagmus in both eyes on looking to the right. Headache is complained of on right side of head between right eye and right ear. Left palpebral fissure narrower than right. Paresis of right lower face is marked. Both on smiling and on voluntary movement the left angle of the mouth only is raised. There is some speech difficulty, possibly due to "stiffness" of mouth. No ataxia of arms.

January 6, 1920. Left palpebral fissure is narrower than right. Apparently there is beginning atrophy of temporal side of left disc. Headache across forehead and between temples. Right facial weakness more marked. Decidedly uncomfortable. Abdominals less on right. Knee jerks and Achilles jerks very active on both sides.

Plantar extension on right. There is a tremor of left foot, even at rest, and of both legs when extended. No tremor in arms. Tongue is slightly tremulous.

Smell tested with peppermint, wintergreen, cloves and cinnamon. All of these were recognized as having an odor, and equally on the two sides, but patient called them camphor. When told what the substance was, readily recognized it (peppermint)—seemed to be a memory defect rather than impairment of smell. No apraxia.

January 6, 1920. The weakness in right lower face is quite remarkable, and is more evident on emotional than on volitional effort. There is no gross aphasia error.

Right hemi-paretic signs more evident than before. My impression is of a neoplasm in left frontal or left temporo-sphenoidal lobe (deep).

Temperature taken for twenty days showed little variation.

Pulses for 72 to 100.

Blood pressure 96 to 104 systolic to 62 diastolic.

February 12, 1920. Sudden death from medulla compression.

DR. COAKLEY said that the case had been sent into the hospital for diagnosis. Very good plates were taken and from their readings he was led to believe that a tumor of the pituitary was producing pressure. From previous experiences, however, it seemed to be very unwise to make a diagnosis of pituitary tumor from radiographic plates alone. In the first few cases the radiographs showed considerable enlargement and deformity of the sella turcica and proved to be cases of pituitary tumor. Some of these cases were operated upon by Cushing and proved to be tumors of that region, and these were so successful that the profession began to regard all cases of enlargement of the sella turcica as probable enlargement of the pituitary body.

Some four or five years ago he had seen a case of very marked ballooning and enlargement of the sella turcica which proved to be a case of abscess of the brain, the pressure of which had enlarged and distended the sella and made it simulate an abscess. That had been sought for at the Presbyterian Hospital on two occasions and not found. The patient died and autopsy revealed a very thick-walled chronic abscess, which might have been relieved very easily by exploring the roof of * * * the sphenoid and vacuating it in that way—but no X-ray could show it.

A little later a patient had been referred to him by a neurologist in Albany. The radiograph showed a large sella turcica. There seemed to be a large mass in that region and all the neurological and ophthalmological findings pointed to the same conclusion. An attempt was made to reach the mass in the sella turcica by the external route but the exploration was not successful; upon the exposure of the cortex the hemorrhage was so great that the operation was stopped and the patient died. Autopsy showed the mass as large as a lemon near the cortex of the right frontal lobe. It was very superficial and had not the hemorrhage been so excessive it would have been perfectly feasible to have shelled out the mass.

These experiences had directed his attention to the changes that take place in the base of the skull as the result of intra-cranial pressure, and it was found that any tumor or abscess of considerable size about the tentorium, anteriorly, mesially, or posteriorly will cause absorption and enlargement of the sella turcica—an expanding and enlargement of that region which will give a picture almost identical with that of enlargement of the pituitary body itself. Therefore it was unsafe to depend upon the reading of the plates in such cases. The eye findings in this case did not check up with what should be a tumor in the sella turcica, which was the cause of sending the patient to the neurological side for the location.

DR. HURD said that as Dr. Coakley had mentioned, Cushing states that a number of cases show indications of dyspituitarism, which on operation prove to be tumors of the brain. Although this patient's history dated back two years, he still felt that there was a little over-activity of the gland, for her hands showed some evidence of it, and then became quiescent.

SECTION ON OTOTOLOGY.

*January 9, 1920.***Case for Diagnosis. DR. GEORGE E. DAVIS.**

The patient, S. K., age 10 years, 11 months, was seen first on March 8, 1919. He gave a history of having had measles six years ago; following this attack, the cervical glands on the left, at the angle of the jaw, and also the parotid gland on the left, were involved and swollen, and have remained so. The glandular swelling is of a boardy hardness and notwithstanding treatment by the x-ray, high frequency currents, local applications, etc., his condition continues about the same.

As the patient was suffering with adenoids in the pharyngeal vault and also with large infected tonsils, the adenoids and tonsils were removed under local anesthesia on March the 12th, with the hope that this would prove beneficial, but it had no effect on the glandular condition.

Family History.—A maternal uncle, at the age of ten, developed a similar swelling on the left side of the neck, which lasted for ten years, when the entire left side of the face became greatly swollen, involving the nose, and an abscess broke into the nose. In one month, all the swelling of the face and neck disappeared permanently.

The case was presented for diagnosis and suggestions as to treatment.

In reply to an inquiry from Dr. Hays as to whether there was any ear involvement, Dr. Davis replied: none whatever.

DISCUSSION.

DR. LESHURE suggested that the condition might be a tumor of the carotid body. Dr. Callison has reported several cases resembling this one some years ago.

DR. HAYS inquired whether there had been any involvement of the ear, and receiving a reply in the negative, said it would seem to be impossible to make a diagnosis without a Wassermann test, and a blood test, etc., for leukemia. He then cited a case showing 20,000 white blood cells and 60% lymphocytes which promptly subsided under proper treatment. Incidentally, this boy had some enlargement of the cervical gland which suggested a leukemia, but various tests would have to be made before the diagnosis could be made.

- (1) Primary Mastoiditis with Perisinus and Extradural Abscess; Operation and Recovery. (2) Mastoidectomy (Perisinus Abscess and Exposure of the Dura) Followed by Attacks of Toxic Insanity—Recovery. DR. OTTO GLOGAU.

(To be published in a subsequent issue of THE LARYNGOSCOPE.)

DISCUSSION.

DR. KOPETZKY had seen two cases in which mental instability existed, and the balance was toppled over during a post-operative period, probably due to the shock of operation.

Whether or not Dr. Glogau's patient was a criminal, is entirely immaterial, but that he is mentally deficient is quite evident; and the balance ordinarily maintained, by which he suppresses his fears, was thrown out, and a condition of imbalance produced by the operation. Dr. Kopetzky does not think that the toxicity and the mastoiditis were any cause in the production of the psychosis, but believes that the patient suffers from a psychosis. Psychosis, as a rule, are more or less intercurrent, and the shock of operation, the fear that the man expressed, his ordinary guards of resistance being inhibited by anesthetic and operative shock, the symptoms are presented then supervened, and the psychosis in its active form had its manifestation.

One should clearly differentiate between results of toxicity, and an imbalance with exaggerated symptoms because of imbalance. We see

too many cases, profoundly toxic, in people ordinarily very nervous, which do not produce the psychosis exhibited by this patient.

It would be interesting to know the real truth as to the psychosis in this man, and whether or not they had a basis in fact; but from an otologist's standpoint, this possesses lesser importance, although the case presented interesting phenomena.

DR. BRAUN, referring to the first case presented by Dr. Glogau, said he did not think any one would be justified in making a diagnosis of primary mastoiditis unless he had observed the case from the start. Every one had seen cases of acute middle-ear suppuration with mastoiditis, where the middle-ear condition cleared up, and the mastoid condition persisted. The name itself, primary mastoiditis, was a very bad one. When they are not due to middle-ear infection, they are usually metastatic.

DR. MAYBAUM said that he had been particularly interested in Dr. Glogau's case of primary mastoiditis, and was in full accord with the remarks made by Dr. Braun. If thoroughly investigated the majority of these cases are found to have had at some time or other pain in the ear, impairment of hearing, etc. Discharge from the middle ear may or may not have been present. Except for the unusual degree of deafness, many of these cases resemble those of acute middle ear catarrh. Such cases are almost invariably due to the streptococcus mucosus; the middle ear infection may clear up entirely, the process continuing in the mastoid, and only after an interval of weeks or even months, give indication of the presence of an acute mastoiditis or some form of intracranial complication.

DR. KAHN said that if he understood correctly, there was a perforation in the cortex. This would seem to indicate an old case, and that the process was active from the time of the primary infection to the time of operation on the mastoid; or the cortex may have perforated after the infectious process remained latent from that date of primary infection, the salt water later infecting the middle ear and the latent infection in the mastoid, thereby setting up irritation and causing the old foci to become active.

In the case of toxic insanity, Dr. Kahn stated that it would seem to him that the insanity may have been due to irritation, traumatism or infection. It would be highly important to make a differential diagnosis in a case of this type. At the time the insanity came on it would be important to learn whether or not you were dealing with a temporo sphenoidal abscess, a meningeal irritation, or an irritation of the sinus, possibly from a traumatic irritation arising from the operation. If at the height of the infection there was fever, perhaps of a toxic character, it could be assumed that you were dealing with a toxic condition. If the fever was low with the insane condition, it could be assumed that it was either traumatic or due to irritation at the point of infection from the operations, or from an irritation in the sinus from clot formation or local infection in the sinus. Two years ago he had reported such a case before the Academy in which such a condition arose—a small clot in the sinus; the case developed into irritative insanity and the patient lost consciousness and was taken into the operating room and both ends of the sinus bled. The next morning the temperature had dropped to normal, and the patient recovered his clarity of mind.

DR. KNIGHT said that last winter he had reported a case of perisinus abscess with subperiosteal abscess, which had developed after an attack of influenza a month or six weeks previously. The subperiosteal abscess was about half an inch behind the auricle, the auricle itself did not stand out from the head. There was no involvement of the middle ear and the drum was practically normal.

The interesting features of this case were that at operation upon removal of the cortex and cells a perisinus abscess was found connecting

with the subperiosteal abscess. The bone in the neighborhood of the antrum was hard and eburnated, showing evidence of a chronic process, and yet with all this involvement of the mastoid the drum membrane was practically normal and there were no signs of middle ear involvement nor was there any history of discharge from the ear at any time.

He believes that in all these cases of mastoiditis without apparent middle ear involvement there is nevertheless a previous infection of the middle ear. In children the Eustachian tube is larger and in all probability the secretion of the middle ear drains into the throat while the infection extends to the mastoid and as a consequence we have the interesting picture of a mastoid without any apparent involvement of the middle ear.

DR. GEORGE E. DAVIS said that both cases were very interesting, especially the second. Being the consultant at two New York State Hospitals for the Insane, he had occasion to notice the apparent effect of toxins on psychic conditions. Some years ago he had reported a psychosis case suffering with a chronic suppuration of both ears in which a double radical mastoidectomy relieved the psychic condition. The patient had been very morose and sullen, requiring one or two attendants to look after him; but after the mastoid operations he regained his former cheerful disposition, fully recovered, and was discharged from the hospital.

Dr. Davis said he did not wish to be understood as claiming that somatic toxic conditions would produce a psychosis, if there was not present some concomitant psychic condition; but he emphasized that a toxic condition of the body might make manifest a latent psychic condition.

DR. HAYS suggested that possibly a primary mastoiditis might have developed through some infection of the canal wall. All had doubtless seen such cases.

DR. GLOGAU, referring to the first case, said the history showed that two or three months before operation the patient had acquired a primary infection after bathing, involving immediately the mastoid, with the exclusion of the middle ear.

Replying to Dr. Braun's remarks, Dr. Glogau said that in the literature many cases had been excluded because they had not been observed from the beginning; but this case had been observed very carefully and the history carefully studied, and from the symptoms displayed it seemed to be a case of primary mastoiditis. Every one, however, was liable to make a mistake.

With regard to the second case, he was surprised to be criticized, for considering it a case of toxicity. Because one is operating upon a special organ, one should not overlook the patient. By talking to the patient or his friends one can often find out whether or not his mental equilibrium is stable, and when he goes to the operating table one may have some idea of what to expect, or if an insanity develops one may not be alarmed. There were two neurologists in consultation on this case, and both insisted that it was suspicious of temporo-sphenoidal abscess. Had the attack of insanity lasted a little longer, he would have been forced to explore the brain by the suggestion of these men and by the surgeon of the family.

It was a toxic case. The patient had had a neglected middle ear, and had signs of absorption of pus before he was operated upon.

We know from the literature that most cases of insanity are of toxic origin—the insanities of pregnancy, of kidney conditions, pneumonia, infectious diseases, etc. This patient did not have a very high temperature. Toxicity expressed itself more in mental disturbance. This patient had a labile mental equilibrium, and had apparently been guilty of

some misdemeanors not long before he came to the operating table. Hence the conclusion that in cases of operation, especially on the ear, we should try to get some insight into the patient's mental status, in order not to be alarmed by the occurrence of such attack of toxic insanity.

The Technique of Mastoidectomy Simplified by the Use of a New Bone Electric Outfit and Paraffin Drainage. DR. A. L. SORÉST.

(Author's Abstract.)

The technique described by the author of the paper aims to render the procedure very speedy, accurate and safe, and also to afford a perfect drainage with early or in favorable cases immediate closure of the wound. The incision of the skin is made somewhat far from the mastoid, and the mastoid is exposed by dissection. After having exposed the mastoid the same is opened with burrs driven at high speed by a special electric outfit. This special electric outfit allows such easy, safe and controllable removal of the bone that it is almost impossible to injure the lateral sinus or the facial nerve.

The reason why these burrs driven by this special electric apparatus rendered the operation safe is that the burrs will only scrape away hard tissue as bone and will not cut the soft tissue of the lateral sinus or facial nerve, unless pressed on purpose against them in order to tear them, and the work with the burrs can be controlled as with no other electric outfit, because of the special construction of the apparatus. This consists of a motor of about 1.5 H. P. and rotating at about two thousand revolutions a minute and has a flexible shaft enclosed in flexible metal tubing. To the end of the flexible shaft is attached a special handle which prevents any vibration of either burrs or saws. The reason why it prevents any vibration is that this handle is rather heavy—about five pounds in weight—so that any motion which may be transmitted by the flexible shaft is neutralized by the weight of the handle, so that the surgeon can work on any bone with the same delicacy that a dentist employs in drilling a tooth. Indeed, it is easy to understand that if the surgeon can open the mastoid and remove all the bone that he wishes to remove with the same delicacy of the dentist drilling a tooth, the operation of mastoidectomy will be much more satisfactory than when done with the chisels or any other electrically driven instrument.

In order to avoid lesion of the facial nerve or lateral sinus the surgeon has to remove the bone very gently and a little at a time, and the burr can be rendered absolutely cool by pouring on the burr a mixture of alcohol and water. Injury to the facial nerve can be absolutely avoided by watching the patient's face when near the spot where the nerve is located. If the face of the patient twitches it means that the surgeon is very close to the nerve, but has not yet approached near enough to do any injury to it, then he has to keep away from that spot so as to avoid injury.

Injury to the lateral sinus can be absolutely prevented by gentle removal of the bone so that the surgeon when close to the spot where the sinus is located moves very gently the burr just as the dentist does when drilling a dental cavity.

Another important feature is the perfect drainage which is indispensable in all cases. This drainage is always obtained by the author's method of paraffin gravity drainage; first by introducing pure paraffin or a body covered with paraffin. This drainage is preferred because to paraffin nothing adheres, neither pus, nor blood nor tissues, so that between the paraffin and the tissues to be drained there is always some virtual space through which the pus can come out. To make paraffin drainage effective however, it must be applied in such a manner that the liquid runs downhill, for liquids run always downhill and never

uphill unless under pressure. When this principle is applied to drainage we will see that the parts to be drained must be on a higher plane than the point of exit, whence the pus must come out, and fortunately this principle can be excellently applied in mastoid cases. In simple mastoid the drainage is applied in the following way: A piece of gauze is dipped in paraffin so that the paraffin covers completely the gauze, and this is brought out through a stab wound made below the tip of the mastoid and the wound is closed completely. In certain cases the wound has to be left open and in these cases block paraffin—that is paraffin poured directly into the cavity—can be used, or the cavity can be lined with gauze previously dipped in paraffin, or the paraffin may be poured upon plain gauze.

DISCUSSION.

The discussion was quite informal. Dr. Soresi was asked how long the dressing was left in. He replied that it depended on each special case; at times it had to be left in for several weeks and sometimes it could be removed a few days after operation. To the question: Do you always drain wounds with a stab wound? Dr. Soresi answered that he always employed a stab wound whether the part to be drained was the mastoid, the abdomen, or any other organ, because in all cases the surgeon is then able to close the original wound and drain through the stab wound and so obtain better results, because if he attempts to close the wound and put a drain at its lower angle as is practiced by almost all surgeons, the tissues that are united by the suture will be infected and will be kept infected by the pus that is running through and along side of the drain; while when a stab wound is used, the original wound has every chance to heal, the pus being deviated by gravity along the line of the stab wound.

In answer to the question as to the average duration of the mastoid wound Dr. Soresi replied that he did not wish to enter into details as he was speaking to experienced otologists and they all knew that while some cases might heal very promptly other cases require quite a long time. His personal experience was mostly confined to cases following influenza and some of these yielded very promptly to the treatment, while some did not. There were more early recoveries when paraffin drainage was instituted than when treated in any other manner.

Asked if everything could be removed with his instrument, Dr. Soresi said that everything could be removed with his electric burr without the use of chisels, curette or any other instrument because the cavity can be smoothed down without leaving the smallest specule of bone. To the question as to where the electric outfit could be purchased Dr. Soresi answered it was a very hard question to answer. One instrument maker had undertaken to manufacture the outfit, but on account of labor troubles had to give it up.

Asked how the burr could be kept cool and the wound clean Dr. Soresi explained that at times it was found very convenient to drop alcohol—about 60 per cent—on the revolving burr. The alcohol keeps the burr cool and the wound very clean.

(To be continued)

